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The Control of Tuberculosis in Rural Areas*

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FIRST let me express an obligation to and an appreciation of the splendid advances in tuberculosis control achieved by workers in the Dominion of Canada. If I appear to be more familiar with work in the United States, it is because my experience in this field has been gained almost entirely outside of the Dominion. I am very much aware, however, of the work done in several of the western provinces and the general interest which has been shown throughout the Dominion in the control of tuberculosis as a socially significant human problem.

Since any approach to the problem of rural tuberculosis involves our philosophy of tuberculosis control in general, it would be well if we can agree on a general program for tuberculosis control. While I was in the process of formulating my own statement of this philosophy, I heard a most interesting presentation on a philosophy of tuberculosis control by Doctor Wade Hampton Frost,† Professor of Epidemiology in the School of Hygiene and Public Health, Johns Hopkins University. Professor Frost's conservatism is no doubt known to many of you, as well as his first-hand experience in this particular field of tuberculosis. In view of the breadth of his view and his competence, I have taken the liberty of presenting his conclusions as a basis on which I think we can all agree.

Doctor Frost states that he believes it to be a reasonable expectation that we may look forward not only to a much further reduction in the prevalence of

*Presented before a joint session of the Canadian Public Health Association (twenty-sixth annual meeting) and the Ontario Health Officers Association (twenty-third annual meeting), Ottawa, June, 1937.

†Frost, W. H.: *How Much Control of Tuberculosis?* *Am. J. Pub. Health*, 1937, 27: 759.

tuberculosis, but to its actual eradication. We should plan a program to be developed progressively and aimed, not to the reduction of tuberculosis to a somewhat lower level, but to its ultimate eradication, for that appears definitely possible. He proposes the following steps:

- (1) To isolate in sanatoria (not in the home) all known open cases so long as the cases remain open.

- (2) To provide adequate medical care, preferably institutional care, for active cases of tuberculosis which are not at the time in an open stage.

- (3) To find additional cases of tuberculosis earlier, by much more vigorous effort, and to bring them promptly under medical care.

- (4) To provide special protection for those groups who, though not at the time suffering from tuberculosis, are most imminently in danger; foremost among these are the families of tuberculous patients, especially among the poor.

In other words, we must make it agreeable to the patient to enter a hospital and to remain there as long as may be necessary without economic loss to himself or to his family.

If we can maintain conditions which exist at present, tuberculosis may eradicate itself spontaneously, but if we make a more vigorous effort directed specifically toward better isolation of known cases of the disease, we may measurably hasten the eradication.

RURAL TUBERCULOSIS—A SPECIAL PROBLEM

Now if we are agreed that this philosophy is sound for tuberculosis in general, can we not move on to state the special adaptation of this philosophy to rural tuberculosis?

I insist that rural tuberculosis is a special problem. It can no longer be truly said that almost every adult person has a positive tuberculin reaction, indicating that at some time he has been exposed to and has acquired tuberculous infection. This statement may still represent the case in some large city groups where it is significant that much of our information about tuberculosis has been obtained. But it is now perfectly clear that this old picture of universal infection with tuberculosis does not correctly represent the situation in many rural areas where the population density is low. Sufficient evidence has now been accumulated to show beyond question that there are typical rural districts where less than one-half of the adult population is tuberculin-positive and where the age-curve of infection as judged by this reaction is very different from the city curve. This reflects a rather profound difference between the epidemiology of rural and urban tuberculosis.

There are observations by many workers in this field which readily confirm this concept of tuberculosis as a different disease in rural areas. Nevertheless, these facts seem seldom to have been seriously applied in choosing the control measures for rural counties. We have gone on assuming that the best procedures were the accepted routines which had been worked out in the large city clinics, without any reference to the density of population; yet it frequently proves very costly to apply blindly these techniques of tuberculosis control which are suit-

able for cities. Where the population density is low, it is possible to find more of the cases and to control the disease more adequately with proved methods than in city areas. Because of this observed rarity of tuberculous infection in those rural areas having few open cases, it should be correspondingly easy to set up effective barriers against personal contacts and thereby achieve a further reduction in the infection rate. Evidence is clear that the family contacts of recognized cases are much more likely than other persons to be positive reactors to tuberculin and more likely as well to have the disease in clinical form. All studies indicate that isolation procedures for positive-sputum cases are much more effective in groups where exposure to mass infection is slight. By selecting the groups among which we should work in rural areas, it is believed that a given effort will accomplish greater results than are possible in a city area.

SYSTEMATIC EXAMINATION OF ALL FAMILY CONTACTS

If we accept the philosophy that it is specially important in rural areas to recognize the disease early and to remove the active cases from their family contacts, it is very natural that we should lay special emphasis on the systematic examination of all family contacts of diagnosed cases. Although this procedure is taken for granted in all good tuberculosis programs, it is surprising how often the effort is casual and how generally the search is limited to a small proportion of all contacts within the family. In the tuberculosis work of Cattaraugus County, New York, persistent examination of all family contacts conducted under the direction of Doctor John H. Korn, director of the study in Cattaraugus County, has resulted in reaching not less than 75 per cent. of those persons exposed to sputum-positive cases. Experience has shown that this is the first step in relative importance after the case is discovered. It is by far the most productive source for the discovery of other cases. Doctor Korn has shown that the cost of finding a new case of the disease among this group is less than one-quarter the cost of searching in the general rural population. It is therefore hard to justify any wider search for the disease until this most likely group has been thoroughly canvassed.

EXAMINATION OF OTHER SELECTED GROUPS

If funds be available for further search beyond the completely studied families of cases, it is evident from the Cattaraugus experience that there are four most likely further sources of new cases:

- (1) Those whose occupations expose them to irritating dust, as stone-cutters and cutlery workers in small village factories. These specially exposed groups are frequently overlooked in rural areas but they usually can be shown to have an excessive rate.
- (2) Racial groups with special susceptibilities, like Indians and Negroes.
- (3) Those of both sexes in the later years of adolescence.
- (4) Young adult women.

It must be true that very few rural health departments will have funds sufficient to carry out more than these indicated procedures with thoroughness. If they do have additional money, there is the field of school children in the

grammar grades and other unselected groups of the public, but experience seems generally to indicate that these are relatively unlikely sources of new cases, whatever the corresponding experience may have been in the large city groups.

IMPORTANCE OF THE CHANGED CONCEPT OF TUBERCULOSIS CONTROL

It has been helpful to me in orienting myself with regard to the control of rural tuberculosis to recognize that for perhaps two decades after the discovery of the tubercle bacillus, the methods of control were centred on the attempt to prevent infection with the organism. As experience gradually increased, it became evident, about 1890, among the groups studied in large cities, that practically every person had come in contact with the tubercle bacillus and that the disease had, in some measure, invaded the body. Accordingly a shift of interest took place from the subject of infection and centred for a considerable time on increasing the physiological resistance of the individual to infection by the tubercle bacillus, since it was assumed that infection was well-nigh inevitable. To a large extent this philosophy still dominates our thinking about the disease and I would point out that it is because of the studies made in autopsy series in the great cities of Europe and America that this concept of universal infection has developed. For a long while it has been true that in areas of scattered population the percentage of adults who have had contact with tuberculosis has been much lower than that found in the cities.

As Professor C.-E. A. Winslow has so well pointed out, it is now true that a shift of emphasis has taken place back to the old concept of preventing infection from the disease and there are certain areas, especially rural areas, where this is entirely appropriate. Take, for example, the experience in Cattaraugus County, New York, where, since 1923, a specially intensive search for tuberculosis has been made. Unusually complete studies of the disease were made by the late Mr. Edgar Sydenstricker and by other highly competent persons. At the end of a recent year, after twelve years of special case-finding effort, there were only thirty-nine positive-sputum cases known to be in this county of some 73,000 population. Of these thirty-nine, all but six had had sanatorium care and the home supervision was considered satisfactory in all but two of these cases. Deaths from tuberculosis are now almost invariably among cases long known to the official agency and the sources of the infection can be mapped out with an accuracy that is surprising to anyone familiar only with the picture in a large city. It would appear that no similar completeness has been achieved in any urban group, perhaps because of the inherent difficulty of charting all the significant contacts of city life. A tuberculosis prevalence has been consistently observed in Cattaraugus County much lower than surrounding urban areas, thus reflecting the difficulty which the tubercle bacilli find in making frequent person-to-person contacts in the more sparsely settled districts.

Because of this observed rarity of tuberculous infection in those rural areas having few open cases, it is correspondingly easy to set up effective barriers against personal contact and thereby achieve a further reduction in the infection rate. All studies indicate that isolation procedures for positive-sputum cases are much more significant in groups where exposure to mass infection is slight.

The philosophy which Doctor Frost has proposed is aimed directly toward preventing infection of persons not previously having come into contact with the tubercle bacillus. This procedure seems amply justified when considered in the light of observed facts in these rural areas. And there seems to be good reason that such a plan as that which he suggests will be effective sooner and more completely than in any urban community.

TUBERCULOSIS, A CHALLENGE TO THE MEDICAL OFFICER OF HEALTH

It is not difficult to understand why some rural health officers have regarded tuberculosis as a disease beyond the reach of their practical resources. There are so many insistent demands on the time of a rural health officer that a disease like tuberculosis which begins insidiously, which is frequently symptomless in its early stages and which runs a chronic course of three or more years, does not attract his attention as do the day-by-day acute conditions which shout for immediate attention. Among rural health officers also tuberculosis is frequently regarded as belonging in a separate category and as a disease requiring special diagnostic skill and an expensive routine for its control, and as a disease condition which, after all, is rather hopeless anyway. I would challenge the rural health officer again to choose any part of his work with the communicable diseases in which a given effort will yield larger results or have more significant social consequences than the isolation of the open cases of tuberculosis and the search for the new cases among the personal contacts of these individuals. Here is a productive opportunity that the average rural health officer may very properly assume and from which he can draw genuine satisfaction because it is based on sound experience in rural districts.

It may be added that there is nothing in this picture of rural tuberculosis which should prove unduly discouraging to the health officer who takes his responsibility seriously. There are valid reasons for believing that efforts toward tuberculosis control in a rural area will bring even greater results than in a city. Certainly there is no apparent justification for the general attitude of *laissez-faire* in rural tuberculosis. This disease is still one of the most devastating enemies of the rural family from the health and economic standpoints. Although numerically not as many deaths are caused by tuberculosis as by some other diseases, the social significance of these deaths is very great because tuberculosis takes its toll primarily among young adults and among the heads of young families.

It seems reasonable to assert, therefore, that when rural tuberculosis is thus regarded as a special problem and is considered in the light of its own epidemiology, the control measures based on the actual situation can be made effective without undue effort. There is reason also to believe that the control of rural tuberculosis is one of the most productive measures from the social welfare standpoint that is open to the rural health officer, rather than the opposite as one would guess from studying what most rural health departments are doing about tuberculosis. We may also say that the procedures approved in general for tuberculosis control lend themselves very well indeed to the special situation of rural areas.

Food Purchases by Families in Edmonton and Lacombe, Alberta

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THIS article deals with a study of the food-purchasing habits of Alberta consumers which was initiated in May, 1936. The purpose of the article is to indicate the methods adopted, to refer to some of the general conclusions, and to present some representative budgets based upon the data collected.‡

METHODS EMPLOYED IN THE STUDY

Data on family food budgets may be collected for at least three important purposes. (a) *The investigation of market phenomena.* This approach may be pursued either from the strictly scientific point of view, *i.e.*, with the purpose of establishing generalizations with respect to the behaviour of buyers, or as a basis for action along lines which may appear to be socially desirable, *i.e.*, in connection with problems of policy, direction and control. (b) *The study of the adequacy of diets and the extent of undernourishment or malnutrition.* Studies of this type are likely to be based on welfare considerations and would seem an essential preliminary to the development of policy and action along lines considered to be for the general social good. (c) *The determination of typical budgets in connection with establishing index numbers of the cost of living and real wages.* This approach is also associated with important practical problems.

The Alberta study was initiated primarily for the first purpose, to increase the knowledge of the behaviour of consumers in the market areas investigated. But the different purposes mentioned are obviously not entirely unrelated. Purchases form the basis of consumption and the study of the behaviour of consumers as buyers indicates some of the significant factors associated with inadequacy of diets. Such knowledge is an essential prerequisite to considered policies designed to reduce this condition. Similarly, the relation between purchases and cost of living is clear. Food purchases constitute only one element, but an important one, in the cost of living.

However, the methods of investigation adopted would conceivably differ appreciably where different purposes were emphasized. Thus the techniques suitable for a market study would be different in certain respects from those applicable to nutritional studies. For market studies the essential data include the amounts actually purchased and the prices paid per unit. In the case of enquiries in connection with the adequacy of diets the quantities to be obtained

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‡A general report on the study has been prepared and will be published shortly. This report does not contain the budgets presented here.

are those actually ingested; prices may or may not be required; the quality of foodstuffs, in so far as this is related to essential food elements, would appear to be important. Quantities purchased may differ appreciably from, and are likely to exceed, the quantities actually consumed. This may result from the elimination of inedible parts of the food purchased, *e.g.*, meat bones, skins of vegetables and fruits, etc.; waste, or edible food which is not consumed, *e.g.*, soured milk, dried bread, etc.; loss in cooking, *e.g.*, in the cooking of meat. Thus of given weights of meat, milk, bread, etc., purchased smaller quantities may actually be eaten. Some indication of the extent of this difference can be obtained where the investigation is devised, or modified, with this in view. Again, variations in nutrient content of a particular kind of food, which may not be reflected in price, might be important from the dietetic point of view. On the other hand where, as in Lacombe, some appreciable part of the consumption requirements is met by the home production of such commodities as dairy products, vegetables and eggs, purchases will diverge significantly from consumption. This would be a factor tending to make quantities purchased less than amounts consumed. A further possible source of difference between purchases and actual consumption is associated with the practice of obtaining data on purchases over a limited period of time, but this problem is related more directly to the adequacy of food-purchase data obtained in this way.

These considerations suggest that methods appropriate to the collection of data on food purchases are likely to be inadequate for a careful study of nutrition, and that quantities purchased cannot be expected to give more than a roughly approximate picture of actual consumption. So far, except where some measurement of waste has been made, no studies appear to have been carried out with the purpose of determining how closely food-purchase data may correspond to consumption, or to what adjustments they might be subjected to effect a larger measure of correspondence. Studies of purchases, as a result of being less intensive and detailed, probably involve less time and expense, and while they can obviously never replace the more painstaking dietetic enquiry, they may perhaps be valuable as a partial substitute which can be used to expedite the work. There is here at least a suggestion of a possible avenue along which future work might be directed.

For the collection of data on food purchases three possible methods may be employed: the questionnaire sent by mail, the collection of estimates, and the keeping of records by co-operators. These methods have all been extensively tried out in other fields of enquiry and their general advantages and limitations recognized. In the Alberta studies all three methods were attempted and the results compared. This comparison led to the conclusion that where the data were to be subjected to detailed analysis the method of using records actually compiled by co-operators, while slower and more costly, appeared to be best. The principal disadvantage of this method would appear to be the possibility of non-compensating errors resulting from the failure to include some purchase. The comparison of results in this case failed to show any differences which could be construed as evidence of this.

The investigations were carried out in two centres, Edmonton and Lacombe. Edmonton has a population of 85,774 (1936 Census) and Lacombe 1,414 persons. The latter town was chosen as being far enough away from Edmonton so that most food purchases would be made within the town itself, at prices not influenced by proximity to a large purchasing centre. It was anticipated that this procedure might establish some significant local differences in food purchases and buying habits. Usable reports were obtained from 353 families in Edmonton. The Lacombe collection was made immediately after the Edmonton survey and 165 reports were obtained, in this case mainly estimates. The initial collection in Edmonton having been made in May-June 1936, further records were obtained in January 1937 from 91 of the original 353 families. The intention in this case was to discover the variations in purchases associated with changes in prices and environmental conditions from season to season.

TABLE I
NUMBER AND COMPOSITION OF FAMILIES, BY INCOME-GROUPS
Edmonton, May-June, 1936

Income-groups	No. of families	Average no. of persons per family	Average no. of adults per family	Average no. of children* per family
0- 499	10	2.6	2.0	.6
500- 999	41	4.0	2.7	1.3
1000-1499	87	4.0	2.8	1.2
1500-1999	62	4.2	3.2	.9
2000-2499	35	4.5	3.1	1.4
2500-2999	19	4.3	3.2	1.1
3000+	45	4.7	3.6	1.2
Total.....	299	4.2	3.0	1.2
Relief.....	54	4.7	2.5	2.3
TOTAL.....	353	4.3	2.9	1.3

*Under 16 years of age.

The records included the food purchases over a period of seven consecutive days. So short a period is open to obvious objections but in practice the length of period is limited by the willingness of the co-operator. The larger number and more representative nature of records covering only a week, probably more than compensate for the disadvantages. Possible sources of error are most obvious in the case of commodities which are purchased irregularly or in large quantities at a time, *i.e.*, particularly non-perishable foodstuffs, and there is undoubtedly some irregularity in the total food-expenditure per week. Other irregularities may be associated with the particular week in the month. These factors are likely to be of different significance in the various income-groups.

In studies of this kind 100 per cent. accuracy may be an unattainable ideal but many of the sources of error can be eliminated when they are recognized, where the sample is large and the collection made by competent investigators.

SOME OF THE GENERAL CONCLUSIONS

As already indicated, the study was designed to permit two types of comparison: a comparison of food purchases in a rural town and an urban centre and a comparison of food purchases at two seasons of the year, early summer and winter.

The comparison of purchases in Edmonton and Lacombe suggested some significant differences between these two centres. Reference is made later to certain relationships between income and expenditure on foods, and the general averages for the two centres were affected by differences in the distribution of families between income-groups. Larger proportions of the Lacombe families were in the lower income-groups and consequently the general averages tended to be lower than in Edmonton. But even within the same groups local differences in prices and food-purchasing habits were reflected in the expenditures. Thus Lacombe families in general spent relatively more on meats and fruit but

TABLE II
COST OF REPRESENTATIVE BUDGETS BY FOOD GROUPS
(For Four Weeks)

Edmonton, May-June, 1936

	Relief	\$500-\$999	\$1000-\$1499	\$1500-\$1999	\$2000-\$2499
	\$	\$	\$	\$	\$
Meats.....	3.27	4.31	4.88	5.94	6.12
Dairy products....	7.32	6.98	8.42	8.97	9.62
Cereals.....	4.76	4.57	4.85	4.59	5.32
Sugars.....	2.26	1.79	2.22	2.02	2.30
Vegetables.....	2.82	2.86	4.08	4.30	5.69
Fruits.....	1.39	2.33	3.15	3.95	4.66
Fish					
Eggs }.....	2.03	2.89	2.54	3.03	2.93
Lard }					
Other food.....	2.38	3.48	3.88	5.32	5.84
TOTAL.....	26.23	29.21	34.02	38.12	42.48

less on dairy products, vegetables and eggs. As would be expected in a rural town, a larger proportion of families provided for their own requirements of such commodities as dairy products, vegetables and eggs. The practice of home-baking in Lacombe was indicated by relatively small purchases of bread and large purchases of flour. Meat prices in Lacombe were significantly higher than in Edmonton, this condition being associated with smaller quantities but larger expenditure on meats. In the case of fruits, prices in Lacombe were either lower or approximately the same as in Edmonton, but the quantities purchased were obviously influenced by the slightly later date at which the Lacombe study was made. Thus strawberries were available at lower prices and relatively large purchases of these increased total fruit purchases in Lacombe.

Such evidence suggests that considerable care must be observed in drawing conclusions from the results of studies in particular locations, but that perhaps

TABLE III
QUANTITIES AND COST OF REPRESENTATIVE BUDGET
(For Four Weeks)

Edmonton, May-June, 1936

Food	Unit	Relief	\$500-\$999	\$1000-\$1499	\$1500-\$1999	\$2000-\$2499
		Q \$	Q \$	Q \$	Q \$	Q \$
MEAT						
FRESH MEATS						
Beef.....	lbs.	24 2.19	24 2.80	20 2.65	18 2.88	21½ 3.20
Pork.....	lbs.	2½ .20	3 .48	3½ .42	3 .57	2½ .45
Lamb.....	lbs.	— —	— —	1 .18	1 .20	1¾ .34
Poultry.....	lbs.	— —	2 .36	1 .20	1 .20	1½ .30
Liver.....	lbs.	½ .10	— —	— —	½ .13	½ .15
Soup bones.....	no.	1 .10	1 .05	1 .05	— —	— —
<i>Total Fresh.....</i>		2.59	3.69	3.50	3.98	4.44
COOKED & CURED						
Bacon.....	lbs.	1¼ .36	1¼ .42	2 .62	2½ .78	2 .70
Ham.....	lbs.	— —	— —	¾ .34	1 .50	1 .50
Weiners.....	lbs.	1 .20	½ .10	1 .20	1 .20	1 .20
Veal Loaf.....	lbs.	— —	— —	½ .12	1 .24	— —
Jellied Veal.....	lbs.	— —	— —	— —	— —	½ .18
<i>Total Cooked and Cured...</i>		0.56	0.52	1.28	1.72	1.58
CANNED						
Corned Beef....	tins	1 .12	1 .10	— —	— —	— —
Potted Tongue..	tins	— —	— —	1 .10	— —	1 .10
Sausage.....	tins	— —	— —	— —	1 .24	— —
<i>Total Canned.....</i>		0.12	0.10	0.10	0.24	0.10
<i>Total Meats.....</i>		3.27	4.31	4.88	5.94	6.12
BREAD.....	loaves	34 2.38	36 2.60	33 2.48	33 2.48	37 2.83
FLOUR.....	lbs.	28 .95	17 .64	19 .68	11 .41	18 .66
OTHER BAKING						
Buns.....	doz.	1½ .15	1½ .15	— —	½ .20	½ .20
Rolls.....	doz.	— —	— —	1 .20	½ .10	2/3 .20
Wafers.....	lbs.	1 .19	— —	— —	1 .22	— —
Cookies.....	pkt.	— —	1 .20	— —	— —	— —
Gingersnaps.....	lbs.	— —	— —	2 .25	— —	— —
Soda Biscuits.....	pkt.	1 .15	1 .15	1 .17	1 .20	1 .20
Pastries.....	doz.	— —	— —	1 .25	½ .18	— —
Pie.....	no.	— —	— —	— —	— —	1 .30
<i>Total Other Baking.....</i>		0.49	0.50	0.87	0.90	0.90
BREAKFAST CEREALS						
Corn Flakes.....	pkt.	4 .32	3 .25	3 .25	2 .17	2 .17
Rolled Oats.....	lbs. & pkt.	4 .24	— —	— —	1 .25	1 .18
Bran Flakes.....	pkt.	— —	2 .20	— —	— —	— —
Shredded Wheat...	pkt.	— —	1 .13	— —	1 .13	— —
Grape-Nuts.....	pkt.	— —	— —	1 .18	— —	— —
Cream of Wheat...	pkt.	— —	— —	1 .16	— —	2 .35
<i>Total Breakfast Cereals....</i>		0.56	0.58	0.59	0.55	0.70
Rice.....	lbs.	2 .15	2 .15	1 .08	½ .05	1 .10
Macaroni.....	pkt.	1 .08	1 .10	1 .15	2 .20	— —
Spaghetti.....	tins	— —	— —	— —	— —	1 .13
Beans.....	lbs.	2 .15	— —	— —	— —	— —
<i>Total Other Cereals.....</i>		0.38	0.25	0.23	0.25	0.23
<i>Total Cereals.....</i>		4.76	4.57	4.85	4.59	5.32

useful conclusions may be established with respect to differences in consumption habits between rural towns and urban centres.

Some significant differences were observed when the Edmonton summer and winter data were compared. For example, total food expenditure appeared to be slightly higher in the winter, with larger proportions used for meats, dairy products and cereals, and smaller proportions for sugars, fish, vegetables and fruit. Meat prices were generally lower in the winter and the quantity purchased per person was substantially greater. Increased expenditure on dairy products was associated with higher prices. The amount of ordinary fluid-milk per person increased but cream and butter purchases were smaller. Higher prices for cereals prevailed in the winter and these were associated with smaller purchases of bread but larger purchases of flour. Quantities of vegetables and fruits were generally lower in the winter; apples being a notable exception. The average quantity of apples bought was almost four times as great as in the summer.

This part of the study suggests that important changes in purchases and consumption occur at different periods of the year. This is an aspect of the problem which might well receive further attention with a view to establishing the extent to which malnutrition may be a seasonal condition.

REPRESENTATIVE BUDGETS

Using the data from the larger sample of the Edmonton summer survey, an attempt was made to determine representative budgets for families in different income-groups. These budgets are presented in tables II and III. In order to avoid possible misinterpretation it seems necessary to outline the method used in compiling the budgets. This will suggest certain limitations to which they are subject.

The families were first divided on the basis of annual family income, eight groups being established (table I). The average weekly family expenditure on various classes of foods, and where possible the average quantities purchased, were then computed for each income-group. These averages formed the basis for the determination of the representative budgets. Certain income-groups were not used for this analysis. The numbers were considered inadequate in the group with incomes below \$500 and also in the \$2,500-\$2,999 group. The highest income-group, families with incomes of \$3,000 and over, contained too wide a range of incomes to give any meaning to a representative budget.

It was found that, using the weekly data, the average quantities were, in some important instances, too small to represent amounts which might actually be purchased. To meet this difficulty the budgets were determined for a period of four weeks. As indicated in table I, the average family differed between income-groups both as to number and composition. No attempt was made to correct for these differences, and the budgets therefore apply to the average family in each income-group. While this has disadvantages, the procedure may have merit in so far as the observed differences in family composition accurately reflect actual differences.

TABLE III—Continued

Food	Unit	Relief		\$500-\$999		\$1000-\$1499		\$1500-\$1999		\$2000-\$2499	
		Q	\$	Q	\$	Q	\$	Q	\$	Q	\$
DAIRY PRODUCTS											
Ordinary Milk....	pts.	64	3.20	52	2.60	54	2.70	54	2.70	58	2.90
Other Milk.....	pts.	13	.74	12	.72	19	1.14	19	1.14	22	1.34
Total Fluid Milk.....		77	3.94	64	3.32	73	3.84	73	3.84	80	4.24
Superior.....	pts.	1	.14	2½	.35	3	.41	3½	.48	5	.67
Cream.....	pts.	—	—	1½	.32	1½	.36	2½	.60	2½	.63
Canned Milk.....	tins	2	.20	1	.05	1	.10	1	.10	1	.05
Butter.....	lbs.	11	2.64	10	2.32	12	2.92	13	3.13	13	3.06
Ice Cream.....	pts.	—	—	1	.26	1½	.39	2	.52	2	.52
Cheese.....	lbs.	2	.40	1½	.36	1½	.40	1	.30	1½	.45
Total Dairy Products.....			7.32		6.98		8.42		8.97		9.62

SUGARS											
Sugar.....	lbs.	22	1.41	18	1.13	21	1.33	18	1.18	25	1.66
Jam.....	lbs.	6	.67	4	.58	4	.58	2	.30	1	.15
Marmalade.....	lbs. & jars	—	—	—	—	—	—	1	.25	1	.39
Honey.....	lbs.	—	—	1	.08	1	.08	1	.10	1	.10
Syrup.....	lbs.	2	.18	—	—	—	—	2	.19	—	—
Molasses.....	tins	—	—	—	—	1	.23	—	—	—	—
<i>Total Sugars.....</i>			2.26		1.79		2.22		2.02		2.30

FRESH VEGETABLES											
Potatoes.....	lbs.	90	1.16	42	.63	51	.78	50	.80	78	1.16
Tomatoes.....	lbs.	2	.29	4	.65	5	.81	4½	.71	5½	.93
Lettuce.....	heads	5	.30	5	.32	8	.54	9	.58	9	.64
Celery.....	bunches	1	.08	1	.08	2	.16	2	.16	3	.24
Cucumbers.....	no.	—	—	1	.08	1	.08	1	.08	2	.24
Radishes.....	bunches	1	.05	1	.05	2	.10	2	.10	3	.15
Cabb. & caul.....	heads	1	.06	1	.12	1	.20	1	.16	1	.16
Carrots.....	bunches	1	.05	2	.10	3	.20	4	.30	4	.30
Turnips.....	no.	1	.05	1	.05	1	.06	1	.06	2	.12
Beets.....	bunches	—	—	—	—	2	.10	1	.08	1	.09
Spinach.....	lbs.	1	.10	1	.10	1	.10	1	.10	1	.10
Asparagus.....	lbs.	—	—	—	—	½	.08	1	.16	1½	.25
Onions.....	lbs.	2	.10	2	.10	2	.10	2	.10	2	.10
Green onions.....	bunches	—	—	—	—	—	—	1	.05	2	.10
<i>Total Fresh Vegetables....</i>			2.24		2.28		3.31		3.44		4.58

CANNED VEGETABLES											
Tomatoes.....	tins	3	.33	1	.13	2	.22	2	.22	2	.23
Tomato juice.....	tins	—	—	1	.07	1	.10	2	.16	3	.24
Corn.....	tins	1	.13	1	.16	1	.12	1	.12	2	.26
Peas.....	tins	1	.12	1	.15	2	.24	2	.24	2	.27
Beans.....	tins	—	—	—	—	—	—	1	.12	1	.11
Pork and beans...	tins	—	—	1	.07	1	.09	—	—	—	—
<i>Total Canned Vegetables...</i>			.58		.58		.77		.86		1.11
<i>Total Vegetables.....</i>			2.82		2.86		4.08		4.30		5.69

TABLE III—Continued

Food	Unit	Relief		\$500-\$999		\$1000-\$1499		\$1500-\$1999		\$2000-\$2499	
		Q	\$	Q	\$	Q	\$	Q	\$	Q	\$
FRESH FRUIT											
Apples.....	lbs.	5	.23	5½	.34	6	.39	5	.31	5½	.37
Bananas.....	lbs.	1½	.15	3½	.36	3	.29	5½	.54	5½	.60
Rhubarb.....	lbs.	2¾	.13	1½	.06	4	.19	5	.25	6	.25
Oranges.....	doz.	1	.28	3	.84	3½	.96	4	1.12	4½	1.40
Lemons.....	no.	4	.12	8	.24	8	.24	12	.30	12	.30
Grapefruit.....	no.	—	—	3	.15	4	.20	5	.30	5	.30
Strawberries.....	boxes	—	—	—	—	1	.20	1	.20	2	.40
Cherries.....	lbs.	—	—	—	—	1	.15	—	—	—	—
Cantaloupe.....	no.	—	—	—	—	—	—	1	.13	1	.13
Total Fresh Fruit.....		0.91		1.99		2.62		3.15		3.75	
DRIED FRUIT											
Prunes.....	lbs.	2	.20	1	.12	1	.13	1	.13	1	.13
Raisins.....	lbs.	1	.15	1	.12	1	.15	1	.17	1	.17
Total Dried Fruit.....		0.35		0.24		0.28		0.30		0.30	
CANNED FRUIT											
Pineapple.....	tins	1	.13	1	.10	2	.25	1	.15	2	.30
Peaches.....	tins	—	—	—	—	—	—	2	.35	1	.18
Pears.....	tins	—	—	—	—	—	—	—	—	1	.13
Total Canned Fruit.....		0.13		0.10		0.25		0.50		0.61	
Total Fruit.....		1.39		2.33		3.15		3.95		4.66	
FISH											
FRESH FISH											
Cod.....	lbs.	1	.18	—	—	—	—	—	—	—	—
Whitefish.....	lbs.	—	—	1	.20	—	—	—	—	—	—
Halibut.....	lbs.	—	—	—	—	1	.25	—	—	—	—
Pickarel.....	lbs.	—	—	—	—	—	—	2	.35	—	—
Salmon.....	lbs.	—	—	—	—	—	—	—	—	2	.45
Total Fresh Fish.....		0.18		0.20		0.25		0.35		0.45	
CANNED FISH											
Salmon.....	tins	1	.15	1	.15	1	.16	1	.20	—	—
Sardines.....	tins	—	—	2	.10	—	—	—	—	—	—
Tuna.....	tins	—	—	—	—	1	.15	1	.15	—	—
Chicken Haddie.....	tins	—	—	—	—	—	—	1	.14	—	—
Shrimp.....	tins	—	—	—	—	—	—	—	—	1	.17
Total Canned Fish.....		0.15		0.25		0.31		0.49		0.17	
Total Fish.....		0.33		0.45		0.56		0.84		0.62	
EGGS.....											
doz.		7½	1.24	9	1.48	8½	1.61	11	1.85	8½	1.86
LARD.....											
lbs.		3½	.46	6½	.96	2½	.37	2¼	.34	3	.45
Total Fish, Eggs, and Lard		2.03		2.89		2.54		3.03		2.93	
BEVERAGES											
Tea.....	lbs.	1½	.72	1	.48	1	.50	1	.50	1½	.85
Coffee.....	lbs.	1	.34	1½	.48	1½	.54	1½	.54	2½	.97
Total Beverages.....		1.06		.96		1.04		1.04		1.82	
Canned soup.....	tins	—	—	1	.08	2	.16	3	.30	2	.20
Miscellaneous.....	...	—	1.32	—	1.24	—	1.32	—	1.66	—	1.98
Meals out.....	...	—	—	—	1.20	—	1.36	—	2.32	—	1.84
Total Other Foods.....		2.38		3.48		3.88		5.32		5.84	

In each income-group the total budget expenditure on each group of foods, *e.g.*, meats, dairy products, cereals, etc., and the total budget expenditure on all food were made to correspond as closely as possible to the average expenditure indicated by the survey material. Subject to other considerations the quantities of, and expenditures on particular foods, or groups of foods, were determined so as to maintain certain relationships already established between increasing income and purchases. Various alterations were evident with rising income: increasing quantities, for example, of bacon and ham, superior milk and cream, citrus fruits and strawberries, lettuce, asparagus and tomato juice, etc.; better quality, for example, the use of fresh fish, etc.; more variety of practically all groups of foods. In general, irregularities in the apparent trend—irregularities which may be associated with insufficient numbers in the sample—have been retained, although where adjustments were required, an effort was made to secure a greater measure of regularity. Such adjustments, *i.e.*, increases in certain items, were necessitated by the elimination of some foods which appeared in negligible quantities. Other items within the same food group were then increased so that the budget expenditure for the group approximated the average derived from the survey data. In other cases a choice had to be made between alternative similar foods, *e.g.*, other baking, breakfast cereals, etc. Here the commodity or commodities most frequently purchased were taken as representative and the expenditure on these raised to equal the total for this group of foods.

The results are subject to obvious limitations including those applicable to the use of purchase data for the determination of consumption in the dietetic sense. At the same time it is felt that they may provide a broadly accurate picture of consumption by Edmonton families in different income-groups, at the date the study was made. This may be useful in the absence of more accurate information.

Arsenical Poisoning of a Large Family*

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DESPITE the frequently repeated warnings of physicians and health officials regarding the care with which toxic substances should be handled, accidental poisoning remains a menace. It is not often, however, that accidental arsenical poisoning of food occurs, nor is it often that more than one or two of a family are affected by such poisoning. The following account of the arsenical poisoning of a family of nine persons is instructive in revealing the health hazard which still exists by reason of occasional carelessness in the handling of toxic agents.

HISTORY OF THE INTOXICATION

The family "X", residing in a small town in the northern part of the province of Quebec during the past seventeen years, has occupied the same dwelling since its construction in 1923. Mr. and Mrs. "X", aged 62 and 63 years respectively, have twelve children, only five of whom were living with their parents last winter: three sons, "A", "B" and "C", aged 32, 26 and 19 years respectively, and two daughters, "D" and "E", aged 26 and 20 years respectively.

Another son, "F" (33 years), who had been working in towns some distance from his home, married "M", aged 22 years, who lived in a neighbouring village, on April 7th. After the wedding, a family reunion was held in the home of the groom's parents and the newly-weds departed for their honeymoon. About a week after their departure and within a period of four or five days, all the members of the family, seven in number, including the father and mother, who remained at home, became ill. They complained of a "grippy" feeling, loss of appetite, sore throat and headache; some suffered a partial loss of voice; the majority vomited rather frequently, during the early stages of the illness at least and, after some days, an oedema of the face was noticeable. As a rule, no intestinal disturbance was experienced. A physician treated them for influenza.

On April 23rd, the newly-married couple returned, in good health, to find the whole household ill. Four days later the young husband was attacked, with the same symptoms: weakness, fatigue, loss of voice, etc.

The illness then progressed; to an extreme muscular weakness were added sensory and motor disturbances: numbness in the legs, sudden pains in the arms and, in certain instances, paresis or even paralysis of the extensor muscles.

The mother suffered, for several days, an intensely reddish skin eruption which covered her whole body except the face; desquamation followed; but she

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experienced no sensory or motor difficulty; she could still move about, despite her weakness, and care for the other patients.

The daughter "D" suffered frequent vomiting spells during a period of a couple of weeks and, later, pains in her arms, persistent numbness in the legs; yet she was able to continue her work, although rather wretchedly, caring for the stock, milking the cows, etc.

The illness of the father began in the same way but was later complicated by very marked sensory disturbances; no motor difficulty was present. On May 15th, the daughter "E" and the son "A" were forced to take to their beds and, still later, the son "C" and the young husband "F" also. The condition of the patients became worse, instead of improving; and finally, because of the fear of anterior poliomyelitis, the father, the two sons "A" and "C", the daughter "E" and the newly-married son "F" were sent to a hospital. There the illness was diagnosed as polyneuritis. The day following their arrival, the hair, nails and urine of the patients "A" and "C" were tested for the presence of arsenic and lead, but with negative results.

In his turn, the son "B", whose condition had improved considerably for a time, suffered paresis of all extremities and, on July 6th, had to be taken to the hospital. In his blood a marked diminution of white cells was noticed, but the examination of his urine revealed nothing particularly suggestive.

Finally, another son, "L", employed by a mining company since the month of February, returned to his home early in July, and he too, but only after about a month with his parents, began to feel the usual weakness. In his case, the illness was milder in character in the early stages and developed more slowly. Gradually the train of symptoms appeared: numbness, oedema of the face and, at last, paralysis of the hands and legs; and on September 22nd, he had to be hospitalized.

The young wife, however, who had not left the "X" home since her return from her honeymoon, April 23rd, suffered no ailment. A nephew, aged 16 years, likewise, although he was a visitor at the home during the last three weeks of July, left in perfect health.

On August 6th, the father was sufficiently recovered to leave the hospital and on August 31st, the young husband also returned to the paternal homestead. At the time of our visit to the hospital in Quebec, late in September, all the five remaining patients were considerably improved; but one son, "A", although his paralysis was much reduced, still had to keep to his bed.

At the paternal home, all the members of the family, except the young wife "M", were found to be suffering from weakness and loss of appetite. The young husband was afflicted with extreme muscular weakness and walked with much difficulty. After his return from the hospital, a nephritis, of which he had been practically cured there, rapidly became markedly acute.

POSSIBLE CAUSES OF THE MALADY

Our questioning of the patients hospitalized permitted us to reject at once any possibility of polyneuritis due to beriberi, since it appeared that the usual food of the family was particularly rich in vitamin B₁, consisting largely of

cereals and vegetables of all kinds: corn, rice, peas, beans, cabbage, carrots, turnips, lettuce, celery, potatoes, etc.

Despite the negative results of the tests for arsenic in the urine and hair of some of the patients, made by the hospital analysts, the medical records and the results of our own examination of the patients led us nevertheless to suspect arsenic poisoning. Indeed, the whole train of symptoms: sore throat, loss of voice, headache, vomiting, oedema, peeling of the palms of the hands and the soles of the feet, sensory and motor disturbances, appeared to be rather significant. The daughter "E", moreover, had a few small cutaneous excrescences on the anterior surface of her hands, barely perceptible, it is true, but which seemed abnormal for a young girl who had done no work for more than a year and a half. Again, the son "A", who had been the most severely affected and who was yet unable to walk, bore still upon his forehead a brown streak of irregular form and, on the upper surface of the feet, near the phalanges, characteristic brown spots. Furthermore, according to the Curé of the town, who frequently had visited the patients, they had all shown, during the course of their illness, rather marked pigmentation of the skin.

Apparently no foodstuffs had been consumed by those who were ill, of which the young wife and the nephew had not partaken; all the members of the family ate much the same kinds of food, although in different relative quantities; and, in general, the food of the "X" family appeared to be more or less similar to that of the other families in the district except, perhaps, that it was of greater variety. The majority of the family ate very little meat and fruit. At times, canned tomatoes or canned corn was added to soups, but it was the practice in the family to place such foods, immediately after opening the can, into a glass container. Most of the food of the family "X" came from their own farm. They had a few cows, hogs and chickens. Mrs. "X" made the butter and baked her own bread. Most of the vegetables consumed were from the farm and, as neither insecticides nor rat poisons had ever been used, there was no reason to suspect the vegetables. As the most frequently employed kitchen utensils were of aluminium, they could hardly be suspected as a cause of the intoxication.

Of foods which were consumed solely by the family "X", there remained apparently only the water, the milk and the products derived from it, and the bread. The bread was prepared with flour bought in one-hundred pound quantities, a yeast of a well-known brand, salt, lard, sugar and a bread powder ("dough improver") of a recognized brand bought from a baker. It seemed very unlikely that the milk could have contained any toxic agent. The water, although from a tubular well, 48 feet deep, which had been in use for fourteen years, might possibly have contained, at times and under conditions difficult of conception, arsenic or other toxic substances, by reason of its more or less prolonged contact with certain minerals. This well consisted of a galvanized iron pipe, 2 inches in diameter, sunk through 40 feet of clay into a bed of gravel.

Samples Collected

For the purpose of determining at once, if possible, the nature of the

intoxication, samples of faeces and urine were collected from all the members of the household, as well as samples of the hair of the head and of the body of the son "F". A variety of other samples was taken, such as milk, milk held in a utensil for 24 hours, cream, sugar, flour, salt, rice, peas, beans, "dough improver" and well water.

A sample of the lime, employed by Mrs. "X" for dusting on the floor of the cellar, was taken, since it might have been deposited on the vegetables and other foods stored there. A shallow well, located near the stable and used only for watering stock, was also sampled. For comparison, a sample was taken from a neighbour's well situated about one-half mile distant, and from a spring on the land of the "X" family, which was sometimes used by the men in the fields in summer, although at the time when the strange illness had appeared, no one had been drinking this water, for the ground was covered with snow. Finally, samples of rock* were gathered from an outcrop in the neighbourhood, with the thought that they might represent the geological formation in contact with the water delivered by the well.

Analytical Results

The examination of the specimens enumerated was performed in the Laboratory of the Provincial Ministry of Health, with the following results:

TABLE I
RESULTS OF EXAMINATION OF SAMPLES OF FAECES, URINE AND HAIR FROM
MEMBERS OF THE "X" HOUSEHOLD

Name	Age	Arsenic as As_2O_3 in milligrams			
		In 100 g. of faeces	In 100 cc. of urine	In 1 g. of hair (body)	In 1 g. of hair (head)
Mr. "X"	62	2.47	.52 †	...	...
"F"	33	.67	.28	.050	.023
Mrs. "X"	63	.40	.13	...	...
"D"	26	.60	.17	...	...
"M" (wife of "F")	22	.97	.44	...	...

These results indicate, in no uncertain manner, that these members of the family were excreting, on Sept. 30th, the date of collection of the samples, arsenic in considerable quantities.

Specimens of faeces, urine and hair from those members of the family who were still in the hospital, were also secured and examined; it is interesting to compare the results obtained (table II) with those shown in table I.

Taking the figures of tables I and II, and assuming the daily excretion, by each person, of 200 grams of faeces and 1,000 cc. of urine, the approximate daily excretion of arsenic by these different members of the "X" family is found to vary from 2.1 to 10.1 milligrams of As_2O_3 for the members who were at

*The Laboratories of the Provincial Ministry of Mines have identified this rock as a chloritous dacite containing traces of mispickel (arsenopyrite).

†A portion of this sample was examined also by the Provincial Medico-legal Laboratory, which found arsenic to be present.

home, and from 0.08 to 0.52 milligrams for the members who were still in the hospital.

It is evident that every one of the ten members of the family had absorbed, in some form, arsenic, for they were all excreting this element; even those who had been, for several weeks, in the hospital were still eliminating small quantities in their faeces and urine, and the hair from this group contained significant amounts of the poison.

The immediate source of this arsenic was sought in the water and various foods consumed by the family. An examination of the samples collected revealed the following results: A trace of arsenic was indeed found in the rock from the neighbouring outcrop, and a trace in the water from the spring which

TABLE II
RESULTS OF EXAMINATION OF FAECES, URINE AND HAIR FROM MEMBERS
OF THE "X" FAMILY STILL IN HOSPITAL ON OCT. 18

Name	Age	Hospitalized	Arsenic as As_2O_3 in milligrams		
			In 100 g. of faeces	In 100 cc. of urine	In 1 g. of hair
"E"	20	June 22	.01	.03	.010
"C"	19	" 22	.00	.02	.050
"A"	32	" 22	.04	.00	.033
"B"	26	July 6	.03	.01	.050
"L"	23	Sept. 22	.01	.05	.100

was used occasionally by men in the fields during the summer months. About 7.5 parts of As_2O_3 per million were found in the scale taken from a large kettle employed for boiling water. The only other sample in which arsenic was present was the bread powder, or "dough improver", but this substance contained 52,000 p.p.m. or 5.2 per cent. of arsenic as As_2O_3 , and also 400 p.p.m. of lead.*

DISCUSSION

The small quantity of arsenic found in the incrustation of the kettle is not really significant; since the rock sample and the water from the spring both contain traces of arsenic, it is readily conceivable that the well water may likewise bear small traces which, although too small to be detected by the usual analytical procedures may, in time, accumulate in the scale of the kettle. But 52,000 p.p.m., or 5.2 per cent. of arsenic (as As_2O_3) in the bread powder evidently constitutes gross contamination by an eminently toxic element; and this arsenic content is sufficient to explain the cause of the whole unfortunate experience.

Mrs. "X", in fact, was using two ounces of this powder (a so-called "dough improver", probably a yeast stimulant of the type commonly employed by bakers) for twelve loaves of bread. If a person consumed about one-tenth of a loaf per day, he would receive a daily dose of about 26 milligrams of

*A portion of this powder was examined also by the Provincial Medico-legal Laboratory; the results confirmed our conclusion that it contained a considerable quantity of arsenic.

arsenic (as As_2O_3) and of about 0.2 milligrams of lead. This small dose of lead is probably not sufficient to cause any disturbance, even if taken daily for several months; it may, however, to a certain degree, have aggravated the effects of the arsenic.

According to the information obtained, the bread powder, which Mrs. "X" employed and of which we took, as a sample, all that remained, was purchased late in the winter or early in the spring; this date of purchase coincides rather well with that of the first symptoms of the illness, which appeared about the middle of April.

It is rather difficult to establish how this contamination of the bread powder could have occurred. It is extremely improbable that it could be the fault of the manufacturer, a nation-wide distributor of food products. Moreover, two other samples of the same brand, purchased on October 20th from two different bakers in the town where Mrs. "X's" powder was purchased, contained no trace of either arsenic or lead. On the other hand, as Mrs. "X" used nearly seven times the proportion of powder recommended by the manufacturer and employed by the bakers, it is possible that, with powder of the same arsenic content, the bakers' bread may have caused no untoward effect; but it is more likely that only the powder of Mrs. "X" was thus contaminated; otherwise the misfortunes of the "X" family might have been repeated elsewhere.

As there is nothing which leads to a suspicion of criminal poisoning, it appears probable that the contamination was the result of an accidental mixing, performed either in the home of the "X" family or in the baker's shop. The family "X", however, insists that no insecticides or other toxic substances have ever been used or kept in the house, and the baker denies any possibility of the occurrence of such an accident in his store.

The arsenic does not appear to have been very thoroughly mixed with the powder. It seems that the quantities of arsenic absorbed were greater at the beginning, for all then fell ill within a period of four or five days, and the young husband "F", who had returned on April 23rd, began to be ill about the 27th, the first symptoms being those of a sub-acute intoxication. On the other hand, the illness of the son "L", who did not arrive home until July, presented rather the characteristics of a chronic poisoning. Only after he had been in the house about a month did he remark the first indications of weakness. The illness progressed slowly at first, paralysis finally appearing after more than two months. Furthermore, the young nephew was also in the house for three weeks in the month of July, and experienced no ill effects.

The men, as a rule, were more seriously ill than the women; this does not necessarily mean that they were more susceptible, for the contrary is generally admitted; very probably the women consumed less bread than did the men. Moreover, Mrs. "X" and her daughter "D" usually drank much milk which, because of its properties as an antidote, no doubt benefited them. The daughter "E", because of a previous ailment from which she had suffered for more than a year, must have had a lowered resistance which rendered her more susceptible to the intoxication.

The case of "M", the young wife, who was not affected in any way, can be explained fairly readily for, according to her own testimony, she ate very little bread and, furthermore, she was the only one of the family to drink large volumes of tea and coffee, the tannins of which may have served as antidotes.

As regards the nephew, very probably his visit of only three weeks was not sufficiently prolonged to induce manifest symptoms of arsenic poisoning; it must be noted, in this connection, that his food consisted largely of milk and cream and that the arsenic content of the bread seems to have been somewhat reduced during this period, judging from the relative delay in the evolution of the malady in the case of the son "L".

Finally there was the rather significant case of the pet dog, which was fed almost exclusively on milk and bread, and which was also ill for two weeks at a time when the whole family was suffering; ordinarily lively and active, it became depressed, would not eat and slept continually.

The probable cause of this intoxication, which had operated from the middle of the month of April, was removed on September 30th when we took, as a sample, from the home of the "X" family, all that remained of the bread powder. The examination of further samples of urine, collected on November 2nd, yielded results which appear to confirm this statement: the sample from the daughter "D" contained only 0.01 mg. of arsenic (as As_2O_3) per 100 cc., and the sample from "M" contained not even a trace of the poison.

SUMMARY

An instance of arsenical poisoning, evidently accidental, caused by the use of a bread powder containing over 5 per cent. of arsenic as As_2O_3 , which resulted in the hospitalization, for several months, of seven members of a family and the serious illness of two other members, is described. The disastrous effects of this wholesale intoxication, which nearly ended in tragedy, emphasize perhaps more than does the usual case of arsenical poisoning, the necessity of constant care and watchfulness in the handling of materials containing toxic agents.

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The Public Health Nurse in Industry*

HAZEL A. LATIMER, REG.N.

The E. B. Eddy Co., Hull, Que.

TO-DAY we look upon industrial nursing as a very important part of public health nursing but it must not be considered as something apart or complete in itself. The basic objective of all public health nursing is the adjustment of the individual to a healthy and happy environment, whether it be the home, the school, or the plant. As industrial nursing shares this basic objective with all other activities in the health field, it is obvious that co-ordination must be established in order to produce the most satisfactory results. All the activities of the industrial nurse for the promotion of health and happiness, both in and out of the plant, must be definitely related to the work of the other agencies in the health field.

Workmen require constant help and supervision. In a highly organized industry, where efficiency is imperative, the nurse who has charge of that most important part of the organization, the human element, must have not only the best hospital training but also an educational background to fit her for the particular field.

Qualifications for Industrial Nursing

The nurse entering the industrial field should have training in the principles and practices of public health nursing. In addition to being a graduate of an accredited school of nursing, she should have met the requirements of registration in the province and have automatically become a member of the Provincial Nurses Association.

After the nurse has completed her hospital training and fulfilled the requirements of registration, is she equipped with sufficient knowledge of people and their home environment to enter industry? She is not. She must have public health training and experience. A post-graduate course in public health nursing at a university, with special emphasis on industrial hygiene, and experience under adequate supervision with a public health organization, are both desirable and necessary for the nurse entering the industrial field.

The experience gained in time spent with one of the local public health organizations, the provincial department of health, the Metropolitan Life Insurance Company or the Victorian Order of Nurses, enables the nurse to visualize home conditions and, as a health teacher, to impart the knowledge of health so that it may be easily assimilated by each individual.

The organization which wants vital work done by the industrial nurse must know the essentials which it ought to demand in the way of qualifications, for without certain essentials the work will fail.

Another important item, and one which has received very little considera-

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tion from the industrial field, is the physical fitness of the nurse. It is assumed that the nurse will look after her own health first; therefore her employer need give it no thought. Unfortunately, the nurse has been trained to think of other people's health and too often she fails to think of her own health, or completely ignores it. Of all the workers in a plant, the nurse should have a thorough physical examination before being employed and this examination should be repeated each year. As the health teacher in the plant, she not only must have a scientific knowledge of health and be able to impart that knowledge effectively, but must also give evidence of physical well-being.

There are several other qualifications which are very necessary for the industrial nurse to possess. She must have sympathy and understanding, be capable of creating good-will, appreciate human values, and be willing to work hard for the improvement of conditions surrounding the employee.

In my opinion the same care should be followed in engaging an industrial nurse as would be given to employing any other employee for a highly responsible position.

Before accepting an appointment, the nurse should have a thorough understanding of a few important points. Firstly, it should be made known to whom or to what committee she will be directly responsible. Secondly, if the plant already has a medical department, the nurse should know specifically her relationship. Thirdly, she should have exact information about hours and salary. Fourthly, she should know what provision is made for the quarters allotted to her for her work; and, finally, there should be a definite understanding about the medical services provided, so that there will be no possible confusion regarding her duties and the duties of the physician.

Organization

The industrial nurse organizing her own department, when there has been no medical service, has many difficulties to overcome. Her training is obtained in the hard school of experience, and to handle such a situation she must have public health training. The various duties of an industrial nurse will depend largely upon the particular need of the industry by which she is employed and also the particular medical service which her employer has outlined.

In many plants, systems of medical and nursing care of the employees are well developed. The fact that an industry is large does not necessarily imply that its medical and safety organizations are more complete than those provided in a smaller plant. In many industries the medical organization is both elaborate and extensive, employing a staff of physicians and nurses. Other firms may employ a part-time physician and one or more nurses; and there are still others where only one nurse is employed, and a panel of doctors is maintained for the employee to choose from when the injury is serious enough to require medical attention. The latter type places a greater responsibility on the nurse.

The medical department should be located centrally in order that all employees may have easy access to it. If the plant is distributed over a large

area it may be necessary to provide more than one medical department. It is desirable to be situated near the employment office to enable the pre-employment physical examination to be carried out before the workman is engaged. The number of rooms required will depend on the number of employees, the proportionate number of men and women workers, and the extent to which the health program is to be developed.

Standing Orders

Standing orders are necessary for the industrial nurse, especially the nurse who is working alone, as medical supervision is not always available. It cannot be too strongly emphasized that the responsibility of treatment and diagnosis rests entirely with the physician and is not to be considered a nursing function. When standing orders cover the giving of drugs and the first-aid treatment of injuries, they should be worded in such a manner that the nurse administers the drugs and treatment solely on the basis of certain symptoms which she observes. Under no consideration must she be put in the position of making a diagnosis. The nurse must take care that she shall not find herself in the position of a substitute for a physician.

Services Within the Plant

In assisting the physician in the carrying out of the pre-employment physical examination, the nurse makes her first personal contact with the worker. The physician usually delegates certain routines of history-taking to the nurse. Ample time must be given for the interview as it may be the worker's first physical examination and he may doubt the value of the procedure. The nurse must endeavour to put the prospective employee at his ease, while taking the history, weight, height and checking the eyesight. If the applicant is a woman, she prepares her for the examination and remains throughout the examination.

Using the result of the examination as a basis for the proper placement of the worker contributes to the reduction of accidents, which incidentally lowers the cost of manufacture.

First-aid is given for the occupational injuries which occur in the plant and the nurse carries out the necessary treatment only under the instruction of a physician. Wounds are treated and transportation and hospital care provided in accordance with the provisions of the Workmen's Compensation Act of the province in which the plant is located.

The first-aid department must not feel that its responsibility is ended when it treats the injuries that follow an accident. Industrial accidents exact a great toll in human life and the nurse must always be a leader in accident prevention. The prevention of accidents is just as important as the prevention of disease.

The industrial nurse who is able to detect the onset of serious illness in employees and direct them to their family physician, will prove most valuable. Assistance to the employee in carrying out the recommendations of the family physician is one of the most important services that she can render.

The greatest contribution the nurse can make to the service is through the teaching of habits of healthful living in the daily life of the worker. While she is not able to change immediately the habits of life-long standing, patient teaching will eventually bring a better understanding and the required co-operation. The employee does need information and education in the matters of health, and such aid he usually accepts gratefully. The building up of physical fitness means the building up of a highly efficient organization, resulting in better service.

The industrial nurse should have an intelligent understanding of the various manufacturing processes, plant housekeeping, plant sanitation and safety programs, and the desires of the management to improve the mental and physical health of the workers. With this knowledge she is able to interpret the various health activities to the employee and assist wherever possible in improving the health conditions in the plant.

One of the many duties of the industrial nurse in the plant is the accurate and confidential keeping of records of the services performed by the department. A knowledge of the Workmen's Compensation Act of the province, and the procedure under it, is essential and in addition the facility and accuracy which are necessary in filling out the forms of the company in the Workmen's Compensation cases. Included in the data compiled are the record of accidents, the nature of injuries, their causes and severity, duration and treatment given. Adequate records enable the nurse to make recommendations to the management on the safety and health activities, which are so vital in any industrial plant.

Let us consider the value of records to the nurse. First of all they are her only tangible means of picturing her work to her employer. Secondly, they give a knowledge of the family and home conditions of those she visits. Thirdly, they make it possible for a new nurse to carry on rather than obliging her to start at the beginning again. Fourthly, a study of the work done and the problems encountered in the past, as shown in the intelligent keeping of records, discloses ways and means of improvement for the future.

Services Outside the Plant

Some industries conduct a very complete program for their employees by providing nursing care in the home as well as in the plant. In a community where practically all the workers are employed by the one industry, this arrangement usually pertains. In other establishments the plant nurse is usually responsible for the nursing service in the plant and a follow-up advisory service in the home.

By visiting in the home, the nurse more readily gains the confidence of her fellow workers and learns their personal background and history. Perhaps they are being worried by a family problem, or again, there may be a physical or mental illness, or a social condition that needs attention. These are occasions when the nurse can make herself invaluable, and afford a splendid opportunity for the education of the family in the care of health, provided that the home visiting is properly conducted. Industrial efficiency depends largely on a

healthful home life—the home environment is a very important factor in the health of the worker.

The Community

The nurse's importance as a factor in the community will depend firstly on herself and secondly on the amount of initiative allowed her by her employer.

The nursing-service department in any plant should establish contact and maintain appropriate relations with existing public health and social agencies. There should be complete co-operation with private physicians, hospitals and clinics. As a public health nurse she brings to industry a knowledge of community resources which enables her to adapt the industrial health program to a larger program in the community.

Supervision

There is probably no other activity in the field of public health nursing which so completely lacks proper supervision as does nursing in industry. In plants where three or more nurses are employed, this problem does not arise. It is the nurse working alone who needs help in difficult problems, stimulus to greater service as a result of encouragement received, and a new interest as a result of the constructive criticism which is always given by the right type of supervisor.

It is to be hoped that in the not-too-far-distant future, the same supervision will be provided for nurses in industry as that which is so efficiently carried out in the other fields of public health nursing.

Hours on Duty

The working hours of nurses in industry are usually longer than those of nurses employed by other public health groups, but they are regular. The basis upon which the hours of the nurse in industry are determined is quite different from that of the other groups, as the service must meet the needs of the workers. The trend in industry is to shorten the hours of the workman, and it is to be hoped that the nurse will eventually share in this reduction of hours of duty.

Relief

Various plants arrange for registered nurses to relieve their nurse during the vacation period and others use a trained assistant as a substitute. On the larger staffs the nurses usually get along without engaging additional nurses for the two weeks' vacation period, which is the time granted to most nurses employed in industry. In some of the larger industrial centres, where the public health groups are closely allied with the industrial group, a nurse from the public health group relieves the industrial nurse during vacation.

Relief should also be supplied to the industrial nurse when she is desirous of furthering her studies, if she is to keep up with the modern trend of public health. Other workers in industry have the privilege of adding to their

education by attending conventions, learning new methods of plant production, etc., so why should not the nurse, especially the nurse who is working alone? The information gained at one of the refresher courses provided for public health nurses by our Canadian universities cannot fail to give the public health nurse in industry a new enthusiasm toward her work and a greater realization of the possibilities of her position.

The Future

The public health nurse in industry must not rest content on any background of nursing preparation which she already has. She must avail herself of the opportunities to supplement her basic training with that newer knowledge of the modern methods in public health in her own and related health fields. As a highly specialized worker she will have greater responsibilities and greater obligations, and will hold a unique place between patient and doctor, employee and employer, and the community as a whole. Industrial nursing will always afford a special opportunity to emphasize prevention rather than treatment, and the nurse, working with and through those with whom she comes in contact, cannot fail to further public welfare and public health. In short, industry needs a good nurse with a knowledge of the methods of social work in addition to an intensive training in the principles and practices of public health nursing.

Practical Aspects of Community Mental Health*

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MENTAL hospitals have taken the initiative in creating an interest in research and in the preventive aspects of mental illness. Through the establishing of clinics in the community, they have abandoned a policy of isolation in an effort to learn of those who are likely to become patients in a mental hospital, the important causes of mental illness, and what can be done to prevent its development.

These are public health questions but as yet there appears to be little interest in them among public health officers. This is due largely to the fact that the objectives of mental health work have not been defined clearly. Our interpretation of the field of mental health has been too general, with the result that our colleagues in public health have not received a clear conception of our objectives. Social problems, domestic difficulties, economic problems, criminality, and delinquency have been included in a jumble in the category of mental health. We have attempted to provide clinics for too large areas and in too many places, and have frequently had too large a number of patients to permit of the best work and the gathering of fundamental information. Consequently, a convincing demonstration of the value of sound preventive principles has not been possible.

The clinic with which I have been associated had 780 new cases during the past year and an equal number were being followed. It is obvious that scarcely more than a diagnosis can have been made in the majority of cases. It is, however, encouraging to record that, of these cases, 82 per cent. were referred to the clinic by practising physicians. This indicates an increasing interest in mental hygiene. It should be significant to those in public health that the practising physician is making such demands for mental health facilities.

There has been a great increase in the number of cases of adult neuroses and convulsive disorders in children being referred by physicians to the clinics. Discussion of such cases affords the opportunity of creating interest in other aspects of mental health, particularly as relating to children, for we repeatedly point out that to recognize a neurosis or other emotional problem in a child or adult is often to know how to deal with it adequately. The following case affords an illustration.

H.W. Male. Age 11 years. It was only with difficulty that social agencies were interested in this case. The father stated that he would co-operate but

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later objected to all the measures adopted. Finally the court ordered that the boy be placed under treatment by the clinic. He was placed temporarily in a small orphanage. In two weeks he was entirely well; he passed his school examinations and had a fine record for general deportment. The father, however, kept interfering. Following a misunderstanding between two social agencies, the boy was returned to his old environment. The father refused to move from his disreputable quarters and the local authorities did not act in the matter. Three weeks later the boy was admitted to hospital with acute gonorrhoeal urethritis. In spite of this failure to keep the boy under supervision by the clinic, he has not developed, to date, serious mental symptoms.

This young boy was suffering a definite mental illness. The acute symptoms were cured readily. A permanent healthy personality can be developed if such a case is recognized and dealt with by local health authorities as a problem in preventive medicine. In spite of the clear demonstration of the dangerous and yet hopeful nature of his illness, nothing has been done for him by the local department of health.

This boy's problems were personal, as problems always are in mental illness. The attention accorded him would have been vastly greater had he been a delinquent instead of a prospective mental-hospital patient. Is not this boy's case a public health responsibility? Is he not more important and certainly more interesting than a case of scarlet fever? Scarlet fever may make him sick for a few days but his present environment is preparing him for permanent residence in a mental hospital at the expense of the taxpayer. When the practising physician and the medical officer of health become mental-health conscious, they will find themselves able to treat the majority of the cases and to provide the necessary leadership.

DELINQUENCY ASSOCIATED WITH MENTAL ABNORMALITY

The absence of delinquency has been commented on in the case of *H. W.* The delinquent or aggressively anti-social individual is not usually a mental health problem. Sometimes, however, we find delinquent trends associated with abnormal mental phenomena, as in the case of:

B. McK. Male. Age 12. He was first seen by the clinic in October, 1933. His father, a soldier, earns \$125.00 a month; is bad tempered, cruel in his punishment of the children, alcoholic; and has no affection for the children. The mother is listless, ineffective, and slovenly. There is constant quarreling between the parents, infidelity and drunkenness by both parents. They refuse to accept responsibility for the conduct of their children. In October, 1933, the boy was engaged in repeated thefts, truancy from school, running away from home, showing seclusive tendencies, although the thefts were with others. He was unconcerned about his misdemeanours, when seen on several occasions following court appearances. During the winter of 1935, while sleeping in a barn, he suffered frozen feet and lost the anterior portion of his foot from gangrene, crippling him to some extent. Peculiar seizures, epileptiform in nature, had occurred. These fits occurred particularly when he was in trouble.

In September, 1936, he was away from home constantly, sleeping anywhere.

There were petty thefts, truancy from school, and about 20 court appearances during the three years. The case was discussed at the regular monthly meetings of social agencies for three years. He was seen by almost every physician in the town, by every policeman and two psychiatrists. From the first, removal from the unhealthy home situation was urged. Physicians, police, clergymen, social agencies, private citizens were concerned in this case, yet before active measures were taken to give him adequate treatment, he had to become a chronic delinquent, suffering hysterical seizures. The authorities and courts refused to consider clinical recommendations because of the expense to the community. The help of an enlightened public health authority, working in conjunction with local organizations, would likely have ensured early treatment and saved the expense of such short-sightedness. The lad is now in a reformatory at public expense. It is significant that the seizures stopped when he was committed to the reformatory.

This boy's brother is now before the courts and a number of others associated with him in his earlier delinquencies have been a source of annoyance and expense to the community. These youngsters all have unhealthy homes, no organized recreation, bad companions, nothing constructive for their play-hours. Is it fair to say that children thus handicapped should be as much the concern of the health officer as is the toxoiding of school children? The medical officer of health with this attitude has a rich opportunity to enlist the active aid of service clubs, social agencies, private citizens, school authorities, where specialists in the field of mental health would only be misunderstood or ignored.

In School Health Services

In many communities the medical officer of health plays an active part in school health supervision. We have consulted with him often in two important types of cases: the child suffering from a convulsive disorder, and the mentally-defective child.

There is great need for more careful study of convulsive disorders. Here is a 12-year-old boy, the eldest of three physically healthy children, who had been excluded permanently from school because of convulsive seizures and extremely violent behaviour toward younger children. His parents are university graduates. The family history is negative. The boy's history shows that convulsions occurred in infancy and although no specific physical disorder could be found, the anxiety of the parents for his welfare was focused intently upon him. His seizures have never been typically epileptic. Often a feeling of faintness is the only complaint. He has developed frequent pains and aches which immediately gain him the attention of the household. Terrific temper outbursts occur on the slightest provocation. He has always been considered sickly and great care is taken to deal with him leniently for fear of precipitating seizures. He has become spoiled, so intolerant of others that he has no playmates. He makes his home a bedlam for days at a time and his younger brothers are beginning to copy some of his actions. The parents, discouraged and heart-broken, consider they have a hopeless epileptic on their hands and are ready to send him to a mental institution in the interests of their other children. Large

doses of phenobarbital over a period of three years have had no effect on his condition.

This patient was not suffering from epilepsy at all. His condition was a combination of serious behaviour disorder from inconsistent discipline and a fully developed neurosis with hysterical seizures. The seizures disappeared immediately upon his admission to a boarding-school. He was treated like a normal boy in every way and was back at home and at school within three months' time.

Many children are being treated as epileptic or sufferers from vague organic disturbances who in reality are cases of childhood neuroses. A diagnosis of epilepsy should never be made without the most thorough investigation, and when a neurotic child is given the attention that the epileptic must have, we prepare him rapidly to be a suitable candidate for a mental hospital.

Physicans are constantly referring cases of the following type:

M. D. Female. Age 16. She started to school at 8 years of age and at present is in the senior-second grade. She is making no progress at school, suffers from night terrors, palpitation, and is regarded as being generally nervous. She has developed habits of indifference and lacks initiative; she cries and wrings her hands when confronted with new work. At other times, she is foolish and childish in behaviour. She is teased at school, because she is so much bigger than the other girls in her class. Although she is in excellent physical condition, her mother describes her as "weakly and nervous."

This girl is mentally defective, of the low-grade moron group. She is unable to apply herself to practical tasks. Recognition of this girl's handicap should have led years ago to early curtailment of formal education, with the substitution of training at home or elsewhere in the community in practical work that was within the limits of her ability. Instead of this, constant failure, constant confrontal with the impossible-of-achievement have led to indifference, negativism, a personality that requires institutional care and training. The higher-grade defectives in our mental hospitals are not there primarily because of lack of intelligence, but because their mental handicaps were not recognized and training adapted to their abilities.

A recent school survey under the auspices of a medical officer of health included 411 children of a representative Ontario town; 92 of these were examined, as suspected of presenting mental-health problems. Of these, 20 were found to have definite mental-health problems, although they were of superior intellect and not considered as any problem in the school. In 12 cases, teachers were frankly surprised that we were at all interested as these children were inconspicuous, unnoticed among their more boisterous and healthful companions because their actions never demanded attention. They were good children—mostly quiet, shy, even seclusive, having difficulties with social relationships and therefore taking less part in social intercourse. Our most serious cases of mental illness come from that group of personalities known as the "shut-in" type. The quiet, unobtrusive, timid, apprehensive, serious, studious, seclusive child must be the concern of the public health organization

interested in preventing mental illness. Endless histories from the files of mental hospitals can be cited to indicate the importance of this statement.

For example, here is a youngster coming to the attention of health authorities for the first time when, at the age of ten, she has an acute mental upset. She records a story of feeling that nothing that she did was right; that she could not put her clothes on because she was forever twisting and turning a stocking that did not seem right, finally giving up in a burst of weeping. She would throw herself on the floor crying when she noticed a wrinkle in a carpet. She wrote and erased until the paper was worn through as she tried to do her lessons. She would not and could not do her accustomed tasks at home and was afraid to take her clothes off at night because of some incomprehensible fear. She could not tell what caused her actions. After a few weeks the attack subsided so that her true personality was studied. She was of very superior intelligence and made excellent progress in school. But she was sensitive, unable to stand criticism from her teacher or playmates, unable to adjust to their rougher ways; her play life was limited; she was much concerned about other people's opinions of her; she was emotionally attached to her parents to a marked degree. Although intellectually superior, she was emotionally immature. In such a case, unless constructive treatment can be instituted, the prospects are further development of the schizoid personality and a life of uselessness, dependence upon the State—probably as a chronic patient in a mental hospital. We are admitting daily to our hospitals adolescents who have lived in communities and attended schools and who were unnoticed because of the very nature of the early unhealthy mental trends.

A child with mental-health problems is frequently referred to as "the nervous child." Any child regarded as "nervous" may be looked upon as a potential mental-hospital patient. Let us consider a typical case—a boy of seven years. The most important symptoms are restlessness, timidity, lack of initiative, lack of self-confidence, enuresis, soiling, food fussiness, and temper-tantrums. He does not play well with other children, gets along poorly at school. His teacher recognizes that he is immature as compared to others and seems unable to dress himself and is disliked by other children largely because of his frequently smelly condition. He is normally intelligent, yet at seven years is showing symptoms that we witness in the adult mentally-ill. With the co-operation of the parents and the family physician, rapid improvement has occurred and the boy is now regarded as normal and healthy instead of weak and nervous.

In all such cases the relation of the individual to his environment requires consideration and often adjustment. Successful treatment involves the following: personal psychotherapy, explanation and discussion of the case with the parents, enlisting the aid of the teacher in treatment, adjusting social relationships through various recreational suggestions, habit training, and careful following to observe overlooked symptoms and to assist in difficulties that arise during the period of treatment.

SUMMARY

Results in individual cases are gratifying but the prevention of mental illness will never be accomplished by the conducting of isolated clinics. The medical officer of health of a community has a great opportunity. Whatever may be argued about the etiology of the more important mental illnesses and their early treatment, it is agreed that the youthful psychotic patient shows evidence in childhood of faulty mental integration. Most often he has been called, almost fondly, a "nervous child" by parent, teacher or physician. Professional health workers will make a contribution of great value to their communities if they look for and find ways of moulding this type of child into an average normal individual.

The function of mental health clinics must be primarily educational. This does not mean that public health workers should bear the brunt of mental health work; but the mental hygienist must have the same relationship to the medical officer of health as the epidemiologist who provides the facts concerning communicable diseases so that the medical officer of health may protect the health of his community. The accumulating of large numbers of case-records by the mental health clinics may be confusing, while intensive study of typical cases presenting real mental health problems provides knowledge for the public health worker which can be of practical use to him in his everyday work.

Although any community offers resources that are useful in the correction or prevention of mental ill-health, there is frequently apathy in assuming responsibility when specific cases have clearly demonstrated the need for community effort. Medical officers of health and the members of the health department have the opportunity of giving leadership so that community resources in the interests of general mental health may be co-ordinated and made effective.

Enquête sur un Cas de Fièvre Ondulante

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LE 26 avril 1937, un jugement était rendu à Washington établissant que les distributeurs et producteurs de lait sont responsables de la pureté de leur produit. Ainsi, le plaignant obtenait \$1,946.50 comme dédommagement du fait qu'il avait contracté la fièvre ondulante en buvant du lait cru qui provenait de la laiterie du défendeur.*

Ce fait nous rappelle des démarches poursuivies ailleurs il y a un an dans la petite ville de "X" où un enfant contractait cette même maladie. Les symptômes cliniques et les recherches bactériologiques ayant confirmé le diagnostic il fallait chercher à retracer l'origine de cette infection et prévenir d'autres cas.

La municipalité intéressée n'ayant que deux fournisseurs de lait, on devait d'abord en éliminer un. Chez le laitier "A", aucune des douze vaches ne donna une réaction d'agglutination positive avec le B. abortus. Par ailleurs, chez le laitier "B", fournisseur de la famille du malade, le lait de plusieurs vaches présenta une réaction positive avec l'antigène du même type.

Dès lors, avec le concours du laboratoire provincial, il fallait trouver les vaches vraiment contaminées ou douteuses. Voici la façon dont nous avons procédé. Sur 42 vaches qui composaient le troupeau, et que nous désignerons par ordre numérique, les n^{os} 11, 15, 21, 22, 24, 29 et 37 donnèrent une agglutination totale caractéristique avec le B. abortus, et le n^o 42 une agglutination douteuse: ce qui signifiait une infection active ou antérieure chez ces vaches. Cependant il a été impossible de déceler le bacille lui-même, malgré une incubation de plusieurs semaines.

Instructions formelles aussitôt étaient données au laitier "B" d'isoler les vaches réactives et de ne pas vendre au public, jusqu'à nouvel ordre, du lait provenant de celles-ci. Ce groupe bovin devenait ainsi un sujet d'étude en même temps que de surveillance au point de vue épidémiologique.

Pour l'agglutination sérique correspondante, 5 à 10 cc. de sang furent prélevés aseptiquement de la veine jugulaire de chacune de ces vaches positives, pour être soumis à l'étude. Cependant, comme la congélation du sang peut produire l'hémolyse et fausser ainsi les résultats, le sérum seulement après extraction par coagulation, fut envoyé au laboratoire pour analyse. En plus, pour épreuve de contrôle, une quantité identique fut ainsi prélevée d'une vache ayant déjà fourni un lait non-agglutinant.

*Am. J. Pub. Health, 1937, 27:913.

Comme résultats, le sang de tout le groupe, exception faite de l'échantillon-contrôle, donna encore un rapport d'agglutination positive au *B. abortus*, mais à des titrages différents, selon la méthode Dreyer.

Maintenant, reconnaissons qu'un lait normal fraîchement trait ne doit pas contenir plus de 500,000 leucocytes par cc. Un comptage plus élevé indique généralement la défense contre une infection active quelconque. Ainsi, la vache n° 11 fournissait un lait comptant 960,000 leucocytes avec chaîne de streptocoques; le n° 29: 2,620,000 leucocytes, le n° 37: 1,470,000 leucocytes. Ces numérations anormales pouvaient peut-être coïncider avec une infection causée par le *B. abortus* chez ces trois vaches. Il y a cependant la possibilité de mammite qui peut influencer sur l'augmentation leucocytaire. Quant aux autres, du groupe, bien que fournissant des agglutinines dans le lait et le sang, elles ne contenaient pas un nombre élevé de leucocytes. Il est donc difficile de déduire ici une relation dans l'origine infectieuse qui nous concerne.

Afin de compléter cette étude, un échantillon de lait de chacune des vaches de ce même groupe fut prélevé directement de chaque quartier du pis, à l'exception des n°s 11 et 37 qui étaient alors taries. L'agglutination fut encore générale, à part des n°s 22, 29 et 42 qui offraient un ou deux quartiers négatifs sur les quatre. Encore là impossible de découvrir le bacille lui-même après une longue incubation des spécimens fournis.

Nous pouvons alors conclure que la vache n° 29 était la plus infectée et en second lieu peut-être les vaches n°s 11 et 37, malgré que le contrôle par quartiers de ces dernières est devenu impossible. Cependant toutes les vaches du groupe en question offrant quelque agglutination et qui avaient été isolées à la suite de nos instructions, furent abattues peu de temps après. Dès lors tout nouveau danger de ce genre d'infection avait disparu chez ce laitier à ce temps là.

Il aurait été intéressant de savoir si le propriétaire et les employés à la laiterie n'étaient pas infectés par le *B. abortus*, par suite du contact continuuel avec le troupeau, mais ceux-ci se refusèrent à fournir des spécimens de fèces et de sang à cet effet. Peut-être par ailleurs l'infection d'une vache à l'autre était-elle causée par les manipulateurs lors de la traite, ce qui est peu probable, mais encore là les moyens de contrôle nous ont échappé.

Disons en passant que les conditions sanitaires dans la vacherie comme dans la laiterie de ce fournisseur sont plutôt pauvres, et que les rapports bactériologiques du lait y sont généralement défavorables. Ces facteurs ont certainement contribué à répandre la fièvre ondulante dans le troupeau.

Heureusement qu'avec un troupeau ainsi contaminé, un seul cas de brucellose a été observé, c'est dire que cette maladie ne se propage pas facilement à l'homme. Le lait, au contraire, aurait transporté beaucoup plus rapidement le germe de la typhoïde, de la diphtérie, de la scarlatine, et d'autres.

Il résulte enfin de tous ces développements et de ces démarches qu'un projet municipal de pasteurisation est maintenant à l'étude pour la ville de "X", ce qui apportera la vraie solution au problème du lait dans cette petite localité.

Investigation of a Case of Undulant Fever

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Ville-Marie, Quebec*

ABSTRACT

THIS report deals with the investigations made subsequent to the appearance of a case of undulant fever in a small village of 2,000 inhabitants. The milk supply was furnished by two dairies. Dairy A, consisting of twelve cows, was not incriminated, as judged by the absence of agglutinins in the milk for *Br. abortus*. In Dairy B, however, the milk of several cows showed agglutinins for *Br. abortus*. This dairy supplied milk to the family in which the case occurred. Of the 42 cows of the herd, 7 showed agglutinins in milk and in blood serum; one additional cow showed only doubtful agglutination with the milk sample and complete in the serum. *Br. abortus* could not be cultured from the milk samples. The leucocytic count in 3 of the 7 cows was very high but no correlation between leucocytic count and *Br. abortus* infection was established. The cows showing positive agglutinin tests were isolated and eventually slaughtered.

Because of lack of co-operation of the proprietor and dairymen in supplying specimens of blood and faeces for examination, evidence of infection in this group was not obtainable. The sanitary conditions of the farm and dairy were poor. The bacteriological reports were unfavourable in the main.

Although this herd was found to be heavily infected with *Br. abortus*, only one human case was discovered. This fact suggests that undulant fever is not as readily transmitted through milk as are typhoid fever, diphtheria, scarlet fever and other diseases.

Following the investigation, the town is considering a by-law to enforce pasteurization of the milk supply. This would locally solve the problem of safe milk.

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COMPULSORY PASTEURIZATION OF MILK SUPPLIES

AT the coming session of the Legislature, the Government of Ontario will introduce legislation requiring the pasteurization of municipal milk supplies. This announcement will be received with great satisfaction by the members of the Canadian Public Health Association. The Association, representing the public health authorities in Canada, has for years presented irrefutable evidence that the only method available for the safeguarding of public milk supplies is properly-conducted pasteurization. The Association has the record of the occurrence in Canada of nearly 8,000 cases of typhoid fever, scarlet fever, septic sore throat and undulant fever that have been traced to milk. The record includes also the tragic story of 688 deaths among these cases. The endorsement of pasteurization by the Canadian Public Health Association is based on the experience of more than 2,000 medical officers of health from coast to coast.

The official records of cases of illness arising from the use of infected milk relate only to the cases that have occurred in outbreaks and therefore represent but a small part of the actual number. Practising physicians know of such cases in their own practice and recognize the inherent dangers of raw milk supplies. It is because of this that the Canadian Medical Association, representing officially the medical profession, urged the compulsory pasteurization of public milk supplies in a resolution adopted at the last annual meeting of the Association, held in Ottawa a few months ago. Thus the organized medical profession and public health forces of Canada are unanimous in supporting compulsory pasteurization.

In Great Britain the British Medical Association has made, within the past few months, public announcements in the press, urging that milk must be made safe. In the announcements it is pointed out that about 2,000 deaths a year in Great Britain are due to bovine tuberculosis and that during the past twenty-four years there have been more than one hundred outbreaks of epidemic diseases, all caused by unsafe milk; such outbreaks would cease if all the milk were made safe.

The statement is often made that the danger of disease transmission by milk can be eliminated by the careful examination and supervision of cattle. Every effort to remove from the herds cows that are infected with tuberculosis is to be heartily commended and excellent progress is being made, through the co-operation of dairy farmers and the Department of Agriculture of the Federal

Government, in eradicating this disease. Another disease among cattle, contagious abortion, is also widespread and transmissible to man through milk, causing a debilitating illness known as undulant fever. The control of contagious abortion in cattle is even more difficult than is the control of tuberculosis. Mastitis, a common inflammatory condition of the cow's udder, may render the milk unfit or dangerous. To assure, therefore, that all milk offered for sale is from healthy herds is impossible. But even if this were possible, the danger of contamination of the milk by human hands would still exist. Persons may harbour the causative germs of scarlet fever, typhoid fever, and septic sore throat; and in milking or in handling and bottling the milk, they may contaminate it. The only safeguard for the consumer is properly-conducted pasteurization. When it is remembered that milk is virtually the only food that is consumed raw which provides a suitable medium for the growth of these disease-producing germs, the necessity for pasteurization is more fully appreciated.

Objection may be taken to making pasteurization compulsory. The situation in Ontario and in other provinces reveals the fact that cities generally require pasteurization, whereas the smaller municipalities have not done so. In every province it is recognized as a duty of the department of health to safeguard the citizens by requiring municipalities to provide a safe water supply. This applies to all municipalities. It is logical therefore that the citizens of the smaller municipalities, where for various reasons the enactment of a pasteurization by-law has been deferred by municipal councils, should receive the same protection that is afforded in the larger cities. Just as the requirement that every municipality be provided with safe water has resulted in a tremendous reduction in the number of deaths from typhoid fever in Ontario and other provinces, so safe milk will result in the prevention of many unnecessary illnesses and deaths. It is true that pasteurization adds slightly to the cost of milk but no one questions the wisdom of the expenditures entailed in safeguarding our water supplies. "Drink more milk" campaigns cannot be justified by public health authorities until municipalities exercise the same care over milk supplies as they do over water supplies and not until there is a general realization that milk as an article of diet must be carefully handled. It is in the interests of the producers and distributors alike to furnish the public with clean, safe milk.

The argument that the nutritional value of milk is affected by pasteurization has been refuted by recent laboratory studies in Europe and on this continent. Under the Health Committee of the League of Nations an important committee has studied the question of milk supplies. Referring to the alleged injury to the vitamins in milk, the report of the committee states that this objection can now "be removed to the limbo of disproved and forgotten prejudices". It can be definitely stated, therefore, that the nutritional value of milk is not affected by modern scientific pasteurization.

There are few measures more likely to stimulate tourist traffic in Ontario

than adequate sanitation, safe water, and safe milk. Pasteurization of all milk supplies will go a long way towards making Ontario the banner province for tourists.

Compulsory pasteurization, adequately supervised, is the only method by which municipal milk supplies may be rendered safe.

CANADIAN DIETARY HABITS

A dearth of information regarding Canadian food habits permits of many loose statements being made regarding the existence or absence of malnutrition. The rarity of vitamin-deficiency diseases, particularly in adults, is evidence that Canadian diets are sufficiently adequate for the prevention of these acute conditions. Since animal experiments and observations on humans indicate that diets, adequate enough to prevent deficiency diseases, may not be optimal for health, it would be advantageous from the viewpoint of public health to ascertain whether Canadian food habits are optimal or whether they range somewhere between the maintenance requirements and the optimum. Professor Andrew Stewart, of the University of Alberta, has recently conducted a survey of food purchases in two Alberta communities, one urban and the other rural. While some of the observed characteristics may be local, there are trends which are probably national. This survey was conducted from the economic rather than from the dietetic viewpoint but many of the observations have nutritional significance. Dwellers in the rural community had lower expenditures for food since they raised vegetables and fruit, kept cows and chickens, and did a great deal of home baking. In both communities financial income had a great effect upon the amounts consumed of some foods. Larger incomes made possible much greater purchases of meat, milk, fruits and vegetables. Contrary to popular belief, consumption of sugar did not increase with income. The data accumulated by Professor Stewart strongly emphasize the role of financial inability as a cause of malnutrition. The amount of money spent by poor families included in the survey could not have provided an optimal diet; the amounts spent by these families for meat, milk, fruits and vegetables provided quantities below a desirable level.

E. W. McH.

CURRENT PUBLIC HEALTH COMMENT

CANCER CONTROL IN ONTARIO

ON May 29, 1931, the Provincial Government of Ontario appointed a Royal Commission "to enquire into and report upon various aspects of the cancer problem, with particular reference to the use of x-ray and radium, the advisability of securing a supply of radium for the treatment of cancer cases and of establishing cancer clinics". The present program may be said to date from that time. During 1932 cancer treatment centres were established at the Toronto General Hospital and the Kingston General Hospital. In January, 1934, a third clinic was inaugurated at the Victoria Hospital, London. These centres are referred to as Institutes of Radio-Therapy and receive Provincial grants. Each of the institutes undertook to provide a stated number of beds for the treatment of indigent cancer patients and satisfactory x-ray equipment. Furthermore, it was stipulated that fees for the treatment of cancer patients be as low as possible. In the agreements it was indicated that one of the duties of the director would be the organization of records and social services and that the details of history and treatment, as well as the findings of examinations made at intervals during a period of at least five years following treatment, should be recorded on forms approved by the Minister of Health.

Later developments resulted in the creation of four other centres. In 1934 clinics were established at the Ottawa Civic Hospital and the Hamilton General Hospital. In 1935 a clinic was established at the Ottawa General Hospital and also at the Metropolitan General Hospital in Windsor. The Government agreed to provide these clinics with sufficient radium and the hospitals housing the clinics were to provide modern x-ray equipment.

In November, 1934, the Minister of

Health convened a committee to advise the Department on the cancer problem. One of the recommendations of this committee related to the need for a uniform system of records for use in the clinics and also for the analysis of the data by the central authority. Studies undertaken by the Department have resulted in the development of a complete set of cancer record-forms and statistical cards. These schedules were supplied to each clinic in August, 1937, and, if they prove satisfactory, will effect a uniform recording of the clinical history and findings as well as the treatment given to each case. Of particular interest from the statistical point of view is the provision for a convenient summary. This is achieved through a set of seven follow-up cards which are to be used by the clinics. These cards are based largely on the National Radium Commission's cards which have been in use in England for over five years. Six are for malignant tumours and one for non-malignant tumours and non-neoplastic diseases. Of the cards to be used for malignant tumours, five are for specific sites (breast, uterus, lip tongue and mouth, upper air-passages, and rectum) and the sixth for sites other than those mentioned. One card is to be used for each patient applying for treatment and contains such information as first symptom and its date of appearance, previous treatment, clinical and pathological diagnosis, biopsy, objective of radio-therapy, stage of disease and site of lesion, interval between first symptom and first consultation, interval between first symptom and treatment at the clinic, etc.

These items appear on the face of each card for malignant tumours. In addition, there is provision for a record of the condition of the patient when followed over a period of years and this refers specifically to the con-

dition at the anniversary of treatment. The back of the card records all treatment received by the patient, whether at the clinic or elsewhere (if available). Space is provided for recording separately x-ray, radium, surgery, and other forms of treatment. In other words, the statistical cards will present a composite summary of each case applying for treatment and will contain, when the case is completed, sufficient material on which to base a careful analysis in respect to survival.

The statistical cards will be returned to the Department once each year. This arrangement will likely save the clinics much effort now expended in the preparation of annual reports concerning patients treated. From the point of view of the clinics, this will be very helpful.

The extent of the cancer control program of the Ontario Government is

indicated by the expenditures for radium which to the end of the fiscal year 1936 amounted to \$364,809. The total expenditure for cancer control at that time, including grants, etc., amounted to \$580,474.

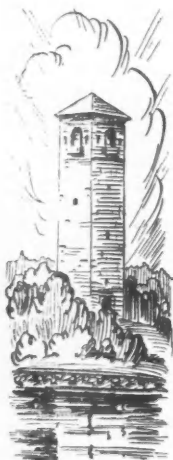
In 1936 there were 1,986 new cancer cases actually treated by radiotherapy in the seven centres. This response is highly gratifying. The number treated provides an opportunity for the clinic directors and their staffs to make available a large volume of information concerning the treatment of cancer cases. Furthermore the data collected through the new record scheme will be of substantial value to those concerned with the education of the public, as well to the clinics and the medical profession as a whole.—*A. Hardisty Sellers, B.A., M.D., D.P.H., Medical Statistician, Department of Health of Ontario, Toronto.*

REPORTED CASES OF CERTAIN COMMUNICABLE DISEASES IN CANADA*
BY PROVINCES—JANUARY, 1938

Disease	P.E.I.	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia
Diphtheria.....	..	12	12	231	21	12	8	16	4
Scarlet Fever....	..	52	38	504	590	144	186	180	78
Measles.....	..	52	48	542	982	158	109	281	658
Whooping Cough..	..	1	1	614	244	52	25	14	183
German Measles..	..	1	..	21	45	2	1	6	18
Mumps.....	..	6	1	433	456	138	36	22	90
Smallpox.....	1	2	1
Cerebrospinal Meningitis....	1	6	1	..	..	..
Anterior Poliomyelitis..	..	2	2	5	2	..	1	5	3
Typhoid Fever...	..	1	6	129	10	1	4	2	6
Trachoma.....	1	..	69	1	1

*Data furnished by the Dominion Bureau of Statistics, Ottawa.

TWENTY-SEVENTH ANNUAL MEETING CANADIAN PUBLIC HEALTH ASSOCIATION HALIFAX, N.S., JUNE 20, 21 and 22



Memorial Tower,
Halifax

PLANS are well advanced for the holding of the twenty-seventh annual meeting in Halifax on Monday, Tuesday, and Wednesday, June 20th, 21st, and 22nd. The Canadian Medical Association will convene its annual meeting in Halifax during the same week. The joint arrangements make a visit to Halifax during that week of particular interest. It is expected also that the members of the Canadian Tuberculosis Association will be in attendance and that the subject of tuberculosis will receive special attention from the clinical standpoint in the Canadian Medical Association meetings and from the standpoint of its control in the sessions of the Canadian Public Health Association. In accepting the cordial invitation extended to the Association first at the meeting in Vancouver in 1936 and again at the Ottawa meeting last year, the Canadian Public Health Association is privileged to join with the Provincial Health Officers Association of Nova Scotia in its annual meeting and

with the Canadian Medical Association in several important sessions in which the subject will be important public health matters. As the national public health association, it has been the policy to hold the annual meeting in turn in the west, central and eastern sections. In this way the Canadian public health needs and problems are presented and the Association is able to fulfil its function of serving every Province. The Association's headquarters in Halifax will be the Lord Nelson Hotel. In planning the program, particular attention is being given to the arranging of programs that will be of general interest. Each of the Sections of the Association is contributing to these programs. In the program of the Canadian Medical Association also, a number of papers relating to the practice of preventive medicine are included so that the whole week may be regarded as of practical interest to every medical officer of health.

It is the purpose of the Local Committee on Arrangements to present a series of brief articles in succeeding issues of the JOURNAL to acquaint the members with the attractions of Nova Scotia, the organization of its public health services, and the city of Halifax.

NOVA SCOTIA—CANADA'S OCEAN PLAYGROUND



A Typical Scene in Nova Scotia.

A Sso many will be interested in motoring, a tour around the Nova Scotia coast is outlined briefly.

Leaving Halifax and Dartmouth, the highway leads through the Dartmouth Lakes and the lovely Musquodoboit Valley, and along the south shore, with countless seascapes of matchless beauty. Through the peaceful St. Mary's River the motorist reaches Scottish Antigonish, in its setting of picturesque hills. Crossing the Strait of Canso into Cape Breton, the visitor will be enthralled by the wealth of scenic beauty: rugged shore lines of sheer grandeur, glens that match those of Scotland, valleys of remarkable beauty. Speaking of the beauty of Cape Breton,

Dr. Gilbert Grosvenor, editor of the National Geographic Magazine, said: "For thirty years I have passed at least a part of every summer in Cape Breton Island. Words are quite inadequate to express my admiration and affection for it." Cape Breton is of special interest to the public health worker for the island constitutes a health unit with a full-time administration. From Port Hawkesbury the highway skirts the beautiful Bras d'Or Lakes, a practically tideless inland sea, and leads to Sydney, on one arm of the famous Sydney Harbour. Nearby are the towns of New



Evangeline's Statue in the Park at Grand Pre.

Waterford and Glace Bay, with their extensive coal mines and iron industry. Across from Sydney Harbour is the town of Sydney Mines. Louisbourg, with its fine museum, and Baddeck, home of Alexander Graham Bell, are of special interest. If time permits, other sections of Cape Breton may be visited. A new national park is being established in the northern section and will be girdled by the thrilling Cabot Trail.

Returning to the mainland at Port Hawkesbury, a side trip may be paid to Guysboro, with its old fort ruins. From Antigonish the road leads westward to New Glasgow; Pictou, a grand old coast town with delightful bathing beaches; and Amherst, the inland gateway of the province. Turning southward, the motorist comes to Parrsboro and the road leads along the Minas Basin, across from which Cape Blomidon stands out in rugged splendor. Following the road through the beautiful Wentworth Valley, past Folly Lake, a tranquil mirror 600 feet above sea level, the motorist reaches Truro, with its thousand acres of natural playground known as Victoria Park. Highway no. 2 leads from Truro to near Halifax.



A Nova Scotia Swordfish Schooner.

Turning northwest, one may visit Windsor, a historic town at the mouth of the Avon River, and the beautiful university town of Wolfville. No part of the visit is more attractive than Grand Pre, made classic ground by Longfellow's "Evangeline". Early in June the whole country is a fairyland of apple blossoms. In Evangeline Park, established on the site of the original Acadian village, with its ancient well still intact, stands a replica of the original Acadian church. At Grand Pre also is the famous old Church of the Covenanters, built in 1790 by New England settlers. At nearby Kentville the annual Nova Scotia Apple Blossom Festival is held. A few miles brings one to the historic Gaspereau Valley and the Look-Off at Blomidon, which, with its magnificent panorama of six river valleys and Minas Basin, provides one of the finest scenic views in Canada.

Farther south is Annapolis Royal, which has the honour of having been the first settlement. Near the tip of the south coast is Yarmouth, the great southwestern gateway into Nova Scotia, with its steamship connections to Boston and New York. In planning a motor tour, the convenience of this short route to Boston will be appreciated. The romantic south shore presents unending vistas of shore scenery. Shelburne, with its unusually fine harbour, was founded by 10,000 aristocrats from New York City, some of whom brought with them a score of Negro slaves. Returning to Halifax, the south and east shores continue to charm the motorist. Lunenburg, home of the finest fishing fleet in America, and Chester, one of the famous summer resorts of Canada, at the head of Mahone Bay with its myriad islands, are of special interest.

The motorist has the choice of a dozen different tours which may occupy from a day to several weeks. Cars can be rented in Halifax and, for those who prefer, motor tours are operated by several companies.

PLANS, PROGRAMS, AND PROGRESS

APPOINTMENT OF JEAN GREGOIRE,
B.A., M.D., DR.P.H., AS DEPUTY
MINISTER, MINISTRY OF
HEALTH, QUEBEC

ANNOUNCEMENT was made recently of the appointment of Dr. Jean Gregoire as Deputy Minister in the Ministry of Health of the Province of Quebec. Dr. Gregoire was born in Joliette County, Quebec, in 1896. He received his classical studies at Joliette Seminary and his medical training in the University of Montreal. Following general practice for four years, he took a post-graduate course in public health at the Johns Hopkins University, receiving the Certificate in Public Health in 1929. In public health work Dr. Gregoire has had an extensive experience, having had charge of Lake St. John County Health Unit and as Director of the Training School for Physicians and Nurses which was early established in Beauce County. Subsequently he served as Inspector of Health Units. During his service as Inspector, he again engaged in post-graduate work at the Johns Hopkins University and was awarded the degree of Dr.P.H. in 1935 on the presentation of an important study in child hygiene. Dr. Gregoire brings to the office of Deputy Minister a wide experience in health administration and a keen appreciation of public health problems.



Dr. Jean Gregoire

RETIREMENT OF DR. S. BOUCHER

THE retirement of Dr. Seraphin Boucher, LL.D., from the office of Director of the Department of Health of the City of Montreal after twenty-five years of service is a suitable occasion to make reference to his outstanding service in public health. Following his graduation he was appointed Assistant Professor of Bacteriology and Histology at Laval University, Montreal, and after post-graduate studies in France he resumed his academic duties, being appointed Professor of Histology. He took an active interest in organized medicine, being one of the founders of the Société Médicale de Montréal and serving later as Registrar of the College of Physicians and Surgeons of the Province of Quebec. He was one of the authors of the first effective medical law to be adopted by the Legislature, and was responsible for the establishing of the first baby health clinic in Montreal in 1901. In 1912 he was requested to organize a system of medical inspection for the municipal employees of Montreal and in the following year was appointed Director of the Department of Health. During his years of service he served on numerous important commissions both in Canada and abroad. In 1920 he was a delegate to the International Public Health Convention in Brussels and in 1926 he was a member of a group of public health experts who studied sanitary conditions in European countries. In 1934 McGill University conferred upon him the degree of Doctor of Laws, honoris causa. He has been honoured also by the American Public Health Association, the Royal Sanitary Institute of London, and the Canadian Public Health Association. Appreciating the value of post-graduate training, he made possible each year one or two scholarships for members of his staff. This generous action has yielded rich

results. In his administration, Dr. Boucher fought vigorously for the pasteurization of milk and for the organization of the essential services to reduce the mortality from diphtheria, tuberculosis, and other diseases. The splendid organization in Montreal is the result largely of his effective leadership.

PROGRESS IN THE ORGANIZATION OF FULL-TIME HEALTH UNITS IN QUEBEC

DURING the past nine months three additional county health units have been established and the city of Three Rivers became the first urban full-time health unit. Last June the counties of Brome-Missisquoi, with Dr. G. Smith, D.P.H., as Medical Officer, and the county of Arthabaska with Dr. J. O. Roy, D.P.H., were opened. In January of this year the county of Shefford was provided with a full-time health service under the direction of Dr. J. Gilbert. The health department in the city of Three Rivers will include the medical officer, a sanitary engineer, six public health nurses, two sanitary inspectors, and a secretary. The work is being directed temporarily by Dr. A. Bossinotte. Plans are completed for the organization of the county of Compton, in which the unit will be in operation early in April. With the opening of this unit, 38 full-time health units will be functioning in Quebec.

TYPHOID FEVER IN VANCOUVER

FIFTEEN cases of typhoid fever, with three deaths, were reported in Vancouver in December. The outbreak is believed to have been due to the consumption of shellfish collected from False Creek and certain sections of Burrard Inlet. As a number of the cases were traced to the waterfront areas, which lack sanitary facilities, consideration is being given to the removal of those who are living in the vicinity of False Creek and the adjoining area, involving about five hundred persons.

DIPHTHERIA TOXOID IMMUNIZATION IN SAULT STE. MARIE

STRIKING evidence of the value of diphtheria toxoid immunization is given in the recent report of the Board of Health of Sault Ste. Marie, Ont. From 1929 to 1933, when immunization was commenced, there was an average of thirty cases a year, and two deaths. In the last four years there have been only six cases of diphtheria, and no deaths.

APPOINTMENTS

Dr. G. F. Amyot, D.P.H., Assistant Provincial Health Officer of British Columbia, has been granted leave of absence for two years to undertake an extensive survey of state health administration in association with Dr. Carl Buck, Field Director of the American Public Health Association. Dr. J. S. Cull, D.P.H., of Vancouver, who has been a member of the Metropolitan Health Board, will succeed Dr. Amyot.

Dr. S. STEWART MURRAY has been appointed Assistant to the Senior Medical Officer of Health of the Metropolitan Health Board of Vancouver. Dr. Murray has been a member of the Health Department, serving as psychiatrist and as Director of Child Hygiene.

Dr. K. F. Brandon, D.P.H., has been appointed Epidemiologist to the Metropolitan Health Board, Vancouver, to fill the vacancy created by the death of Dr. E. S. Carder, and Dr. E. J. Curtis has been named Consultant in Communicable Diseases.

Dr. H. G. Chisholm, formerly Assistant Superintendent at Tranquille Sanatorium, has been appointed a member of the Tuberculosis Division of the Provincial Board of Health of British Columbia.

BOOKS AND REPORTS

Maternal Deaths: *The Way to Prevention.* Iago Gladston, M.D., Secretary, Medical Information Bureau of the New York Academy of Medicine. The Commonwealth Fund, 41 East 57th Street, New York, 1937. 115 pages. Cloth bound, 75 cents; paper covers, 50 cents.

MATERNAL DEATHS: THE WAY TO PREVENTION is without doubt the most lucid and concise statement of the problem yet written. Designed for laymen as well as health workers and physicians interested in community effort, it presents the problem, the need, and the way to implement present knowledge.

The problem of maternal deaths is pictured using chiefly the data from the New York Academy of Medicine study. The facts demonstrated by this and similar recent scientific studies are discussed. The following are the chapter headings: The Preventable Deaths, Antepartum Care, The Attendant at Delivery, Midwife Practice, Place of Delivery, Operative versus Spontaneous Delivery, Caesarean Section, Anaesthesia and Analgesia and Abortion. Despite the fact that the text of the book consists of only ninety-two pages, all essentials are included, only technicalities being omitted.

The author has devoted the book to emphasis upon the lessons taught by the untimely and preventable deaths of 1,343 women in New York City during the years 1930-1932. In the closing section the author catalogues the outstanding facts. Among these are: that half of the maternal deaths occurring in childbirth are preventable, that among a small group of women there is an exaggerated fear of the hazards and trials of pregnancy and labour while the vast majority of women are ignorant of abnormal developments during gestation, that the obstetrical service is not of the best or even as good as it could be, and that there is too much meddlesome obstetrics and too many

instrumental and operative deliveries.

In discussing the focusing of attention on this issue Dr. Gladston stresses the fact that "maternal mortality will be reduced only by a concerted effort in which all who share responsibility contribute their respective parts. The task requires individual, group and community co-operation." In discussing what can be done, attention is directed toward what the public can do, and special emphasis laid on the fact that a substantial part of what can be done is a task for the medical profession.

This book has been written in the light of facts and with a clear conception of the limitations placed on attempts at immediate improvement by virtue of our economic and social setup. It deserves to be widely read.

A. Hardisty Sellers

Rural Health Practice. Harry S. Mustard, Associate Professor, Public Health Administration, School of Hygiene and Public Health; Lecturer, Preventive Medicine and Public Health, School of Medicine, The Johns Hopkins University. The Commonwealth Fund, New York, 1936. 603 pages. \$4.00.

INSTEAD of a title "Public Health Administration" Dr. Mustard has preferred "Public Health Practice". The term "practice" implies performance in contrast with theory. Practice is the keynote of the volume. It is written for the local medical officer of health with a kindly remembrance that the physician occupying this position has probably little or no appreciation of statistical procedures or the compiling of records and desires an authoritative digest of what may be considered the best procedure. The suggestion in the title that the work specifically is of interest to rural health officers is to be regretted as the volume will be of equal value to health officers of towns and smaller cities. "The rural health officer," Dr. Mustard reminds us, "is

a general practitioner of public health who is without extensive library facilities and who for this reason must be furnished with material not essential to one engaged in a narrower practice." The success of the author's efforts is due in no small part to his wide experience and keen sense of values. He presents differences of opinion in discussing various subjects but leaves the health officer with what seems to him a sensible course to pursue.

Following a brief review of the development of rural health departments, the relationship of the local department to the state department is presented. Two chapters outline the organizing of a local health department in a rural community. Thereafter the planning of the local health program is discussed. In turn, public health education, vital statistics, school health services, maternity and child hygiene, the control of communicable diseases, and sanitation are presented.

Within the compass of 600 pages Dr. Mustard has succeeded in presenting the practice of public health, particularly as related to smaller communities, in a manner that will be highly appreciated by the physician responsible for health administration.

R. D. Defries

The Mentally Ill in America. *A history of their care and treatment from Colonial times.* Albert Deutsch. Doubleday, Doran & Company, Inc., Garden City, N.Y., 1937. 530 pages. \$3.00.

THIS reference book on the progress in mental hygiene in the United States should be read by everyone interested in mental hygiene. Though it is written about the problem in the United States, the writer, by references to and analyses of foreign literature, correlates the progress in the United States with that in other countries. The volume presents a comprehensive survey of the development of the treatment of the mentally defective and the insane in America since the time of the first colonists. The large number of

references contained in the bibliography makes the book invaluable for reference purposes. The slow evolution of this branch of medicine from ancient times is traced and, by maintaining the point of view of a social historian rather than that of a psychiatrist, the writer shows the close relationship of this progress to the development of civilization as a whole. The later chapters are especially recommended to workers in any mental institution or in field work in mental hygiene, for the reason that the modern concepts of mental hygiene are so well stated and the status of any type of treatment or care of the mentally ill can be readily assessed and correlated with modern concepts.

This book has been compiled as a socio-historical survey, based on the analysis of original articles, papers, laws, legal cases, historical accounts, etc., and thus intended solely as a reference text. The large number of references adds greatly to its value. The mass of documentary evidence, however, is apt to discourage the average reader. The biographical sketches are especially well done and give the book greater reading interest as well as furnishing workers with a word-picture of the more important people who have contributed to the development of mental hygiene both in the United States and in other countries.

While the author presents the various theories of psychiatry, he remains impartial other than to draw general conclusions as to the relationship of these theories to the progress of this branch of science and to sociology as a whole.

H. A. Ansley

Memoranda of Toxicology. Max Trumper, B.S., A.M., Ph.D. P. Blakiston's Son & Co., Philadelphia, 1937. Third edition. 304 pages. \$2.00.

THIS small book is a ready source of information about the common forms of poisons and their effects. It should

be of great practical value to physicians, nurses, and laity, especially where larger works are not available and in cases of emergency. The chapter on the handling of poisoning cases both before and after death presents clearly the duties of the physician or the nurse.

The addenda include discussions of alcoholism, general nature of poisons, drug addiction, neuro-psychiatric aspects of intoxications by lipid solvents, first-aid, and administration of antidotes. Each type of poison or irritant is discussed in a definite sequence, *e.g.*, the nature and the action of the substance, the clinical symptoms of poisoning, the post-mortem appearances, the treatment of cases, and the tests used to identify the poison. Sufficient details are given without too highly technical discussion. The sections on alcohol are especially timely in relation to the "drunken driver" and the modern changes in the diagnosis of drunkenness and alcoholic poisoning. The relationship of the modern tests to medico-legal work and the diagnosis of both ante- and post-mortem conditions is discussed. The chapter on the neuro-psychiatric aspects of intoxications by lipid solvents deals with the neuro-toxic syndromes elicited by several specific poisons such as trichlorethylene, carbon bisulphide, triorthocresyl phosphate (ginger paralysis), benzol, and alcohol. The writer stresses the industrial hazards and the psychic syndromes of these types of poisons.

The index is much too brief and it would have been helpful if the references to other literature, found throughout the book, were collected.

H. A. Ansley

Sickness and Insurance. *A study of the sickness problem and health insurance.* H. A. Millis, Professor of Economics, University of Chicago. University of Chicago Press, 1937. 166 pages. \$2.00.

DR. MILLIS'S book is timely in that it presents concisely the nature and extent of the sickness problem from its

sociologic and economic angles. In the kaleidoscopic view of the subject which is given in the earlier part of the text, much detail is of necessity omitted. Drawing data from authorities on this continent, particularly the American Committee on the Costs of Medical Care, however, a clear statement of the problem is made. Costs of sickness, methods of attack upon the problem of medical care, incomes of doctors, etc., are some of the subjects touched upon.

To many the section on compulsory health insurance abroad will be welcome, despite the fact that it is considerably abridged. The essence of the developments and present practice in Germany, Great Britain and France is given. Of special interest to Canadians is the section on the health insurance movement in the United States. Here Professor Millis, a keen and practical economist, focuses attention on the present problem of medical care with suggestions for the future.

The author's suggested plan to make provision for major illnesses which "constitute a relatively small percentage of the total but which account for approximately one-half of the outlays for medical care" is in some ways desirable merely because it is a partial solution to a real social problem, yet it does not make much provision for preventive medical care. The minor sicknesses which are often the forerunners of major ones will be neglected. Objection to such a plan is supported by the observation that much of the increase in recorded sickness in countries with health insurance schemes is traceable to the fact that medical care is now given for minor disturbances which would have been neglected before.

This book attempts to answer such questions as: What is the present problem of sickness? What has been the attack made on the problem elsewhere? What might the solution to the problem be?

A clearer, terse exposition on sickness and insurance would be hard to find.

A. Hardisty Sellers

CURRENT HEALTH LITERATURE

Diphtheria Prophylaxis

A STRONGLY-WORDED condemnation of the use of alum-precipitated toxoid in a single injection, the so-called "one-shot" method. In 1,179 children in the age-group $5\frac{1}{2}$ -7 $\frac{1}{2}$ years, all of whom were Schick-positive and in an environment where the Schick-negative rate was well under 20 per cent., the author reports that of 568 Schick-positive children receiving one dose of $\frac{1}{2}$ cc. of alum-precipitated toxoid 162 (29 per cent.) were Schick-positive when retested 3 to 5 months later, in contrast to 611 children receiving two doses of $\frac{1}{5}$ and $\frac{1}{2}$ cc. respectively, with an interval of 14 days. Only 8 (1.3 per cent.) were found to be Schick-positive when retested 3 to 5 months later. Eighty-seven children originally Schick-negative as a result of the single-injection treatment were retested one year later and 24 (28 per cent.) were found to have relapsed to a definite and in some instances strongly Schick-positive state. From the data relating to 152 children receiving 1 dose approximately 50 per cent. were found to be Schick-positive at the end of one year. The situation resulting from the use of the one-dose method is considered by the author to be alarming, since reliance is being placed by many physicians on the one-dose method.

The practicability of applying toxoid intranasally in children, according to Jensen's method, is also discussed and an attempt to substitute for intranasal application the breathing of air in which toxoid had been sprayed for a period of fifty minutes is described. The occurrence of distressing reactions precluded further trial of this inhalation method. Reference is made to the experience of the author in successfully immunizing 25,000 children during the last twelve years. Three doses of antigen were used and not a single serious case of diphtheria occurred in the group.

Guy Bousfield, Med. Officer, 1938, 59: 5.

Chicago's Progress in Sewage Treatment

FOLLOWING careful studies of the economics of sludge disposal as applied to Chicago conditions the new south-west works will replace disposal of sludge by digestion by dewatering and incineration. The waste sludges will be mixed, treated with ferric chloride and dewatered on vacuum filters. The filter cake will be mixed with previously-dried sludge and the mixture passed through heat vapours in the flash drying system. The excess dried sludge will be fed into the furnace in pulverized form. All vapours from the drying sludge will pass through the furnace to destroy odours. An ultimate saving of several millions of dollars in the complete sewage construction program is expected.

Mun. San., 1938, 9: 17.

Increase in the Average Length of Life in the United States]

IN 1930 the expectation of life at birth was 59 years for white males and 63 years for white females. The corresponding expectations for Negroes were 48 and 50 years, respectively. The decline in mortality rates has been most rapid for the ages of childhood, adolescence, and early adult life. For the ages above 50 years, mortality rates have remained practically unchanged. The increase in expectation of life since 1900 is equal to the increase in the previous 100 years. The remarkable increase in expectation of life at birth which has occurred since 1900 cannot be repeated in the next generation unless methods are developed for preventing and controlling the diseases of middle life and old age. It has been estimated that the ultimate longevity attainable with present knowledge is about 70 years, or about 10 years greater than in 1930.

Harold F. Dorn, U.S. Pub. Health Rep., 1937, 52: 753.

